DOCUMENT RESUME

ED 302 496 SO 019 608

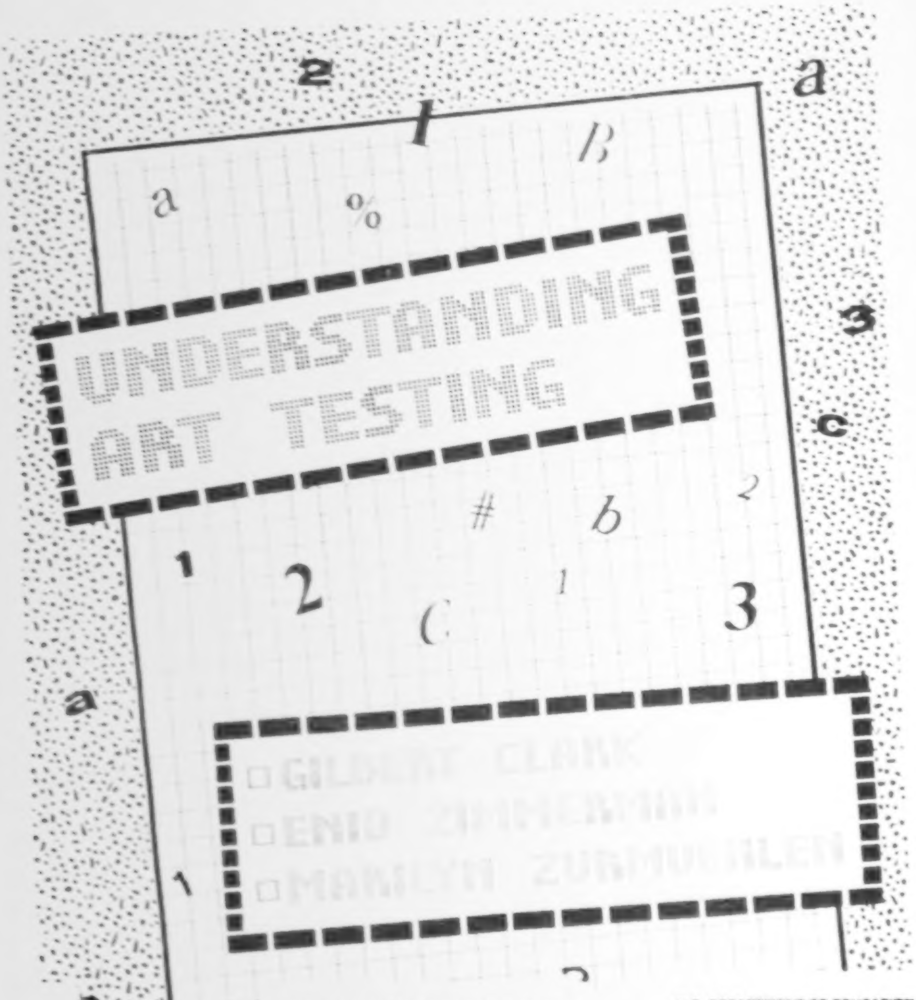
AUTHOR	Clark, Gilbert; And Others
TITLE	Understanding Art Testing: Past Influences, Norman C. Meier's Contributions, Present Concerns, and Future Possibilities.
INSTITUTION	National Art Education Association, Reston, Va.
PUB DATE	87
NOTE	140p.
AVAILABLE FROM	National Art Education Association, 1916 Association Drive, Reston, VA 22091.
PUB TYPE	Books (010) -- Collected Works - General (020)
EDRS PRICE	MF01 Plus Postage. PC Not Available from EDRS.
DESCRIPTORS	*Aptitude; *Art Expression; *Children; *Childrens Art; Creative Art; Educational History; Elementary Education; Freehand Drawing; Literature Reviews; *Testing
IDENTIFIERS	*Meier (Norman C); Meier Art Tests

ABSTRACT

This collection of 10 papers focuses on art testing and Norman C. Meier's role in this area of study. The titles written by Gilbert Clark are: (1) "Early Inquiry, Research, and Testing of Children's Art Abilities"; (2) "Norman C. Meier: A Critique of His Tests and Research"; and (3) "Recent Inquiry and Testing of Children's Art Abilities." The titles by Enid Zimmerman are: (1) "Norman C. Meier's Story of Frustrations and Accomplishments"; (2) "Meier's Interlinkage Theory of Special Ability: Art Aptitudes of Children and Creative Processes of the Artist"; and (3) "Art Talent and Research in the 1920s and 1930s: Norman C. Meier's and Leta S. Hollingsworth's Theories about Special Abilities." Marilyn Zurmuehlen has written: (1) "Questioning Art Testing: A Case Study of Norman C. Meier"; (2) "An Historical Look at Developing Art Tests: Norman C. Meier and His Students"; and (3) "A Psychologist Studies Artists." The last paper, "Implications for the Future of Inquiry, Research, and Testing of Children's Art Abilities" includes an excerpt from a conversation among the three authors. The book also contains a selected chronology of publications on inquiry about children's drawings and testing of art abilities and an extensive bibliography that corresponds with the chronology. Drawings, charts, and black and white photographs are included. (DJC)

****
*   Reproductions supplied by EDRS are the best that can be made   *
*   from the original document.   *
****

ED302496



UNDERSTANDING ART TESTING

☐ GILBERT CLARK
☐ ENID ZIMMERMAN
☐ MARILYN ZURMUEHLEN

"PERMISSION TO REPRODUCE THIS MATERIAL IN MICROFICHE ONLY HAS BEEN GRANTED BY

D.G. CANNON

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

☒ This document has been reproduced as received from the person or organization originating it

☐ Minor changes have been made to improve reproduction quality

● Points of view or opinions stated in this document do not necessarily represent official OERI position or policy

SO 019 608

UNDERSTANDING ART TESTING: Past Influences, Norman C. Meier's Contributions, Present Concerns, and Future Possibilities

---

Gilbert Clark, Indiana University
Enid Zimmerman, Indiana University
Marilyn Zurmuehlen, The University of Iowa

The National Art Education Association

Copyright © 1987
National Art Education Association
1916 Association Drive
Reston, Virginia 22091

Cover design by Marilyn Zurmuehlen

UNDERSTANDING ART TESTING:
Past Influences, Norman C. Meier's Contributions, Present Concerns, and Future Possibilities

Preface: *Enid Zimmerman* i

Chapter 1: Early Inquiry, Research, and Testing of Children's Art Abilities. *Gilbert Clark* 1

Chapter 2: Norman C. Meier's Story of Frustrations and Accomplishments. *Enid Zimmerman* 19

Chapter 3: Meier's Interlinkage Theory of Special Ability: Art Aptitude of Children and the Creative Process of the Artist. *Enid Zimmerman* 26

Chapter 4: Art Talent and Research in the 1920s and 1930s: Norman C. Meier's and Leta Stetter Hollingworth's Theories About Special Abilities. *Enid Zimmerman* 36

Chapter 5: Norman C. Meier: A Critique of His Tests and Research. *Gilbert Clark* 46

Chapter 6: Questioning Art Testing: A Case Study of Norman C. Meier. *Marilyn Zurmuehlen* 60

Chapter 7: An Historical Look at Developing Art Tests: Norman C. Meier and His Students. *Marilyn Zurmuehlen* 68

Chapter 8: A Psychologist Studies Artists. *Marilyn Zurmuehlen* 75

Chapter 9: Recent Inquiry, Research, and Testing of Children's Art Abilities. *Gilbert Clark* 86

Chapter 10: **Implications for the Future of Inquiry, Research, and Testing of Children's Art Abilities.** *Gilbert Clark, Enid Zimmerman,* and *Marilyn Zurmuehlen* 143

Chronology: Inquiry About Children's Drawing Abilities and Testing of Art Abilities. *Gilbert Clark* 161

References: 171

List of Figures

Chapter 1:

Figure 1. Thorndike's Scale for the Merit of Drawings by Pupils 8 to Fifteen Years Old (Four selected images)

Figure 2. Thorndike's Test of Aesthetic Appreciation (Sample display)

Chapter 3:

Figure 3. Meier's Interlinkage Theory of Special Ability

Chapter 4:

Figure 4. Hollingworth's Theory About the Nature of Abilities and Disabilities

Chapter 5:

Figure 5. Meier Art Test: 1. Art Judgment (Sample item - four image comparison)

Figure 6. Meier Art Test: 2. Aesthetic Perception (Sample item - four image comparison)

Chapter 6:

Figure 7. Norman C. Meier lecturing about a painting

Figure 8. Norman C. Meier as painter

Chapter 8:

Figure 9. Subject manipulating composition apparatus (Meier standing at left)

Figure 10. Three sketches by Oscar Beringhaus of Taos, New Mexico

Figure 11. Letter to Norman C. Meier from Jacques Lipshitz

Figure 12. Sky People, by Sioux artist Calvin Larvie

PREFACE

For the past decade, Gilbert Clark and I have researched and written about the development and nurturance of abilities in the visual arts. In our meanderings through this literature, we frequently came across references to the Meier Art Tests and the Meier-Seashore Art Judgement Test. Clark was intrigued with the idea that there might be some of Norman Meier's papers and research materials at The University of Iowa. In December 1982, he spoke to Marilyn Zurmuehlen, Head of Art Education at The University of Iowa, to ask whether she knew of any archival material that related to Norman Meier. Zurmuehlen responded that she had done some checking and had located Norman Meier's papers in The University of Iowa Archives. Clark and I were excited by this information and we applied for, and received, a grant from Indiana University's School of Education to travel to Iowa and stay for five days to study the Meier archival materials.

Soon after our arrival in Iowa, Zurmuehlen accompanied us to The University of Iowa Archives. We previously had made arrangements with the Curator of Archives to have Norman C. Meier's papers available. We were told that we were the first researchers to request the Meier Papers since they had been placed in the University Archives. Wheeled out to us on a cart, as the three of us assembled around a large library table, were seven archival boxes of correspondence, one archival box of personal papers, and four additional archival boxes of reprints, cuts for illustrations, manuscripts and lectures, and slides. A large box contained memorabilia consisting of newspaper articles, cards, drawings of research apparatus, slides, and photographs. In addition, there was a separate stack of books and tests.

For five days, we diligently read and examined these items, occasionally making comments to one another. The Meier papers were not catalogued which meant that we looked at every document, studied every object, and took notes about materials we thought would be interesting to study further. We did not approach the Meier papers with any preconceived notions except that we were acquainted with the Meier Art Tests that seemed to be somewhat dated and naive in conception.

Meier was an inveterate collector and it appeared he never discarded a letter he received nor disposed of a carbon copy of a letter he sent. Copies of his course notes, radio talks, and invited lectures also were filed with his correspondence. The correspondence reflected both positive responses to his work and negative comments about his personal and professional worth. The eight unexpurged files and the beginnings of an unfinished autobiography imply that perhaps Meier was waiting for someone to find this information and tell his story.

After five days of perusing Meier's papers, the three of us sat down and exchanged reactions to the data. Our different life experiences, educational backgrounds, and areas of research expertise produced multifaceted responses to the Meier papers. From these differences emerged not only an interest in Meier's life and impact on the art testing movement, but to a much greater extent, Meier's work emerged as one case study in the history of the art testing movement with implications for its present and future status in the field of art education. Our conundrum concerned deciding how we would each describe, interpret, and analyze some of the original source material we had encountered in the Meier papers. Should we write individual papers or collaborate on a group of papers?

Methodology and Context

"Biography," according to Clifford (1983), "is not a treatise on life but the evoking of life" (p. 57). Archival data that enrich our understanding of a person's life also can serve to demonstrate how a person living at a specific time responded to his or her environment and how that environment affected his or her professional efforts. Historiography involves reconstituting events from the past, using primary sources that form bits and pieces that eventually evoke a semblance of wholeness and unity. Each researcher's reconstitution of events to create unity is to some extent idiosyncratic and dependent upon his or her value and belief systems and chosen research stance. Researchers can highlight a particular person or event or they can use their data to describe much wider arenas and present more panoramic points of view.

Erickson (1985) described four styles of history that encompass philosophical positions and methods of historiography as they relate to literature in art education. The realist historian is described as one who attempts to bring a subject to life by putting him or herself into the life situation of a person from the past and expressing how he or she thought. The formal historian is concerned with putting past events into an order or structure from which they can be understood in a unified context. The expressive historian is interested in using the past as a vehicle for making an individual statement. The pragmatic historian views the past as a source for understanding and sometimes solving problems in the present. Erickson noted that historians need not be purists and can take more than one stance in their research.

The same position, that more than one research stance is possible and in fact desirable, is advocated by researchers who use what is termed anthropological or naturalistic methodologies. MacGregor (1982) described the relationship between anthropology and history as that of "cousins by marriage."

> The historian tries to construct what was the present for the group, while the anthropologist tries to reconstruct events that continue to influence the group during the period in which it was under scrutiny. (p. 3)

The historian, however, is not able to interview persons from the past to check his or her observations and has to form opinions based on primary and secondary sources such as interviews with contemporaries or descendants, newspaper articles, diaries, personal correspondence, journal articles, and influential writings by others. The naturalistic researcher, to an even greater extent than the historian, is encouraged to report research from a number of points of view.

The notion of the Roshomon effect in research was described by Beittel (1973) as occurring when the same incidents are related from different points of view. He advocated:

> let the accounts of unique proliferate, and let the viewpoint of the person reporting define his own relation . . . to the events he is trying to understand. (p. 9)

The notion of viewing events from several points of view is referred to as triangulation in naturalistic inquiry. Sevigny (1981) described triangulated inquirers as utilizing

> multiple comparisons of a single phenomena, group or unit at two or more points in time or they purport to use multiple perspectives to measure a single phenomena at a single point in time. (p. 73)

Naturalistic inquirers use case study methodology rather than writing scientific or technical reports because this methodology

> is more adapted to description of multiple realities encountered at any given site; because it is adaptable to demonstrating the investigator's interaction with the site and its consequent biases that may result (reflexive reporting); because it provides the basis for both individual and "naturalistic generalizations" (Stake, 1980) and transfer abilities to other sites (thick description); because it can picture the value ~~positions of~~ investigator, substantive theory, methodological paradigms, and local contextual values. (Lincoln and Guba, 1985, pp. 41-42)

Reporting Methodologies for the Meier Papers

Clark, Zurmuehlen, and I decided that we had a somewhat unique opportunity to have three researchers approach the topic of art testing from different points of view using a variety of methodologies. The core of our reporting would be to treat Norman Charles Meier's contribution to the art testing movement as a case study to represent past influences, present concerns, and future possibilities.

This monograph is an amalgamation of our research about inquiry, research, and testing of art-related abilities that we struggled with for over four years. We exchanged papers, corresponded frequently, met again in Iowa City in 1984 to revisit the Meier Archives and share ideas, and presented various phases of our work in progress at The University of Cincinnati Paper Exchange (1984), The National Symposium for Research in Art and Artistic Development (University of Illinois, 1984), The National Art Education Association Convention (Miami, 1984), and The History of Art Education Conference (The Pennsylvania State University, 1985). These conferences and site visits provided feedback that helped shape the final version of this monograph.

The monograph is divided into ten chapters, a chronology of selected publications, reference section, and appendix. In the ten chapters, different historical styles, including realist, formal, expressive, and pragmatic stances, are represented. The reporting includes a triangulated approach to inquiry in so far as a variety of points of view are expressed in regard to the same or similar phenomena at different points in time. Methodologies include psycho-history, reflexive reporting, theory analysis, personal interviews, test analysis, and in-depth description. Using these multifacted points of view and adaptations of historical and naturalistic methodologies, we believe we have presented the past, present, and future of art testing in a rich and comprehensive manner that should be useful to art teachers, teachers of academically gifted and artistically talented students, administrators of gifted and talented programs, art educators interested in art testing, and educational psychologists. In the time line and reference section, information and sources are presented that are not found together in any other publication. The history of art testing, its present status, and future implications for the field of art education, are neglected in contemporary literature. We hope this monograph provides an impetus that will renew interest in inquiry, research, and testing about art abilities.

Enid Zimmerman
Bloomington, Indiana
April 1986

CHAPTER 1

Early Inquiry, Research, and Testing of Children's Art Abilities

Gilbert Clark

In what may be an apocryphal story, Carrado Ricci, of Bologne, Italy, has described how he took refuge under a portico to avoid being soaked by a drenching rain in 1882. Once there, he became fascinated with his observations of children's graffiti drawings on the walls, noting the differing character of the lower, mid-level, and highest drawings. "I had not known that under this arch was to be found a permanent exhibition, both literary and artistic . . ." (Maitland, 1895). From this fascination, he became known as one of the earliest persons to study and research children's drawings in a systematic way. In 1887, Ricci published *L'Art dei Bambini* (The Art of Little Children) in which he discussed a number of phases in the development of children's drawings that have been studied and reported in great detail by subsequent researchers. These include the evolution of children's drawings, the child's sense of aesthetics, development of the sense of color, and comparison between children's and primitive people's drawings.

In London, Ebenezer Cooke published an analysis of children's drawings, in 1885, that was influential both on educational practices and subsequent researchers. Whoever was first, we know that the study of art abilities has been actively pursued with varying degrees of intensity from the 1880s to the present. Before 1900, at least 20 journal articles or books had reported various characteristics of children's drawings, including Earl Barnes' (1893) "A Study on Children's Drawings." This was one of the earliest attempts to interpret content and techniques in large groups of children's drawings. Barnes (1893, 1895, 1897, 1902) went on to publish several studies of children's drawings and became the designer of a major methodology as well as a major interpreter of educational implications of these studies.

The Study of Children's Drawings

Dale Harris (1963) has categorized the study of children's drawings into three historical periods with differing emphases. These are: (1) 1885-1920, descriptive investigations that intensified during the period 1890-1910; (2) 1926-1940, experimental and correlation studies that compared drawing abilities with intelligence and other abilities; and (3) 1940-the present, psychological, projective studies that concentrate upon the content and "afford a basis for organizing much of the observed phenomena of children's drawings" (Harris, 1963, p. 11).

Harris pointed out that, during the first period, there were few serious attempts to establish theoretical explanations of children's drawing behaviors or the character of children's drawings. Subsequent researchers have approached the study of children's drawings with some theoretical stances. These, however, have been diffuse and include developmental stage theories, theories of intelligence and achievement, theories of personality study and adjustment behaviors, and theories of perception and cognition. The efforts of people who pursue various theoretical stances may or may not be of value to other researchers whose goals differ.

In an early writing, Ayer (1916) described several different methods used to study children's drawings. His descriptions are useful today with a few additions. Ayer pointed out that collection and study of children's drawings can proceed from:

Objective Methods

A. *Gross Products Method.* This method entails indiscriminate collection of large numbers of drawings.

B. *Special Products Method.* This method requires pupils to create drawings related to some specific theme, such as illustrating a story.

C. *Comparative Products Method.* This method is based upon collection and comparison of one defined group of students or subjects with another. It may or may not require gross products or special products as an assignment.

Subjective Methods

A. *A Single or Biographical Method.* This method is based upon collection and analysis of numerous drawings by a single subject, or limited group of subjects, created over an extended period of time. It may or may not include accompanying records of related behaviors covering the same period of time.

B. *Experimental Method.* This method calls for one or more stipulated drawing tasks carried out in a relatively controlled experiment. The resultant drawings are analyzed to relatively specific and defined criteria.

In the following discussion, major studies of children's drawings from various parts of the world will be cited that used the above methods. As examples, one or two studies by principal researchers will be described in each section and the methods used will be noted.

Research in Germany

From 1900 to 1920, more than 50 additional studies of children's drawing abilities had been reported, including the important work of several Germans. Lichtwark (1887), Levinstein (1905),-Kerschensteiner (1905), Stern (1906, 1911), Lamprecht (1906), Albien (1907), Kik (1908), Duck (1913), Meumann (1912, 1914), Buhler (1919), Wulff (1927), and Hartlaub (1930) added major new insights to the growing literature about children's development and about their drawings.

Lamprecht (1906) incorporated several methods later described by Ayer (1916), in his internationally based research. He mailed a series of detailed instructions to educators in various parts of the world (Belguim, Sweden, Italy, England, Russia, Japan, the United States, India, and Africa) asking them to collect:

A. Spontaneous drawings of children not influenced by suggestions or training (gross products method),
B. Specific representative drawings of named objects and of story illustrations (special products method),
C. Biographical series of drawings from individual children (biographical method), and
D. Drawings by adults representative of the working population of each country (gross products method).

The results were collected and classified at the Museum of Culture and Universal History of Leipsig, Germany and various interpretations of the collection were reported by Levinstein (1905), Kohler (1908), and Kretzschmar (1910).

Kerschensteiner (1905) conducted a monumental research from 1903 to 1905 in which he attempted to reveal the entire course of the development of drawing by children and children's capability of expression from 6 to 14 years of age. Beginning in 1903, Kerschensteiner collected 96,000 drawings from 7,000 children in the schools of Munich, Germany. During three visits Kerschensteiner made to schools, students were asked to draw pictures of their mothers, fathers, themselves; a horse, dog, cat, and bird; a flower, tree, chair, church, and tram way, and a snow battle from memory (gross products method). They also were asked to draw another student in their class, a chair, violin, and a water pitcher from observation (special products method).

Within Kerschensteiner's population, there were 2500 children identified as possessing special aptitude in drawing. These children carried out the above tasks and, in addition, drew a man carrying a wooden beam, a woman carrying a water cask, and a specific building in their community. These were also observational drawings (special products method).

Other information was gathered about the children who participated in Kerschensteiner's study including ages, parents' professions, whether they had access to picture books in their homes, and their past participation in art-related activities. In 1904, Kerschensteiner collected more than 100,000 additional drawings from children in kindergartens and a school for "idiots". In addition, he collected 52,000 more drawings that had been created in response to an assignment to design a book and a plate pattern.

The result of these studies was the first reporting of a developmental series of stages describing how children's art abilities change during the school years. The reporting of this and other research Kerschensteiner conducted led to wholesale reorganization of drawing instruction in the schools of Munich. Kerschensteiner's work generally is recognized as a distinct contribution to the psychology and pedagogy of drawing (Michael & Morris, 1986). Kik (1908) studied biographical drawings by 13 students with remarkable drawing ability as well as superior ability in other school subjects. He was one of the first investigators to note correlation between drawing ability, environmental influences, and intelligence. Meumann (1912, 1914) used comparative products to study observable differences between behaviors of highly able and less able groups of art students. From this work, he was able to describe 11 causes of inefficiency in drawing that can be interpreted as drawing skills that need to be taught in the schools (Clark & Zimmerman, 1984). In addition, Meumann reported that *all* behaviors in drawing are observable across all students; no behaviors in drawing, therefore, are exclusive to highly able or less able students. By this contribution, he called attention to the need of researchers to focus attention on qualitative aspects of drawings, as Kik had before him, and to look at factors outside the child or the child's art work.

Research in France, Belgium, Holland, and Switzerland

Some of the earliest research about children's drawings was conducted in Western European countries. Important contributions continued to be made from this region, over many years, by researchers in France, Belgium, Holland, and Switzerland. Perez (1888) and Passy (1891) used direct observation of selected children and specific assignments to report some of the very earliest biographical research.

In a model biographical study, Binet (1908-1909) studied a highly talented youngster to determine the origins of talent in young people. He learned about a young painter, Tade Styka, and, with the cooperation of Styka's father (also a painter), made an extensive investigation of the mental characteristics and talent of this young man. Binet observed Tade Styka at work, administered a series of mental tests to him, developed a biographical sketch of Styka, and carried out an extended series of interviews in which the young painter's interests and techniques were discussed. Others who reported early biographical studies include Brown (1897), Sully (1895), Shinn (1893), Lukens (1896), C. & W. Stern (1910), and Luquet (1913).

Schuyten (1901, 1904, 1907) studied how children represent the human figure from ages 3 to 13. He used the special products method and attempted to establish a standard of excellence, or a series of age norms, across the public school years. Schuyten visited schools, unannounced, and asked school children to draw the figure of a man in whatever way they were used to drawing it. By this method, he obtained over 2,200 drawings; the drawings were sorted into age groupings in six-month intervals from ages 3 to 13 and were approximately equally representative of male and female subjects.

The resulting drawings were studied and graded using a highly specific scale of representation. Scores were assigned for representation of each specific feature, proportions, and similarity to "classical ideals". As Harris (1963) pointed out, this research was ultimately unsuccessful and the proposed scale of age-grade norms was abandoned "but the idea is worthy of note as one of the earliest attempts to devise a purely objective measuring scale based on age standards" (p. 13). Schuyten's method was used by others, notably Lobsein (1905), to establish that as children develop across the grades their drawings of the human figure approach more nearly realistic standards and that low-ability students are slower to develop this ability.

Other researchers whose work was highly recognized were Clamparede and Geux (1907), Ivanof (1908, 1909), and Rouma (1913). Clamparede and Geux, in 1906 and 1907, collected over 12,000 drawings from 3,000 pupils. In a special products method study, they asked pupils to (1) make a representational, observational drawing of a chair or stool that had been placed in their view, (2) draw a cat from memory, (3) illustrate the fable, *Le Corbeau et la Renard* (The Crow and the Fox), and (4) draw an image of whatever they wanted to draw (gross products method). Each pupil was described as to sex, nationality, class and class-rank, general ability, academic strengths and weaknesses, and a rating of general mental ability. The purpose of Clamparede and Geux's research was to determine how taste and aptitude for drawing evolve during the school years and how they correlate with drawing ability, aptitude, and achievement in other school subjects, and general intellectual ability.

Study of correlation between drawing ability and intelligence was assigned to Ivanof, who was a student of Clamparede. Ivanof selected and studied 9,764 drawings from Clamparede and Geux's original collection. Ivanof (1909) developed a scoring scale that was based upon a sense of proportion, imaginative conception of subjects, and technical and artistic skills. These were weighted equally. He also compared drawing scores of various age groups to teachers' ratings of general ability, comparative standings of pupils in other school subjects, and certain specific moral and social traits. He reported, for instance, a tendency for those most able in drawing to be able, all-round students and the opposite tendency among those poor in drawing. Such results were reported in relation to children's ages rather than their grade levels.

Rouma (1913) conducted a complex series of biographical studies with special populations of slow and gifted students in Belgium and Switzerland. As a result, he was able to describe stages of development in children's drawings, various characteristics of drawn images, the use of drawings as a form of communication, and the bearing of drawings upon intellectual development. He also speculated about the place of drawings in the interrelations of races and species. Rouma, with care that was unusual at that time, developed a developmental scheme for representation of the human figure and described specific differences to be found between the drawings of subnormal and average students.

Research in England and the United States

In England and the United States, a number of researchers had begun to investigate similar concerns. The very first, perhaps, was the English teacher Ebenezer Cooke (1885), who described four stages in children's drawings though "his observations were not especially accurate" (Lansing, 1976). Soon after, Earl Barnes (1893, 1895, 1897, 1902, 1908), Henry Turner Bailey (1895, 1912), Arthur Clark (1897), and Edward Thorndike (1913, 1916) added their unique insights about understanding children's art development.

Barnes (1902b), for instance, interpreted 700 essays written by children in response to these directions, "Describe the prettiest thing you have ever seen and say why you thought it pretty" (p. 180). He later went on to study over 21,500 children's drawings produced in response to hearing a poem, rich in imagery; thus, he set a single, definite problem as the incentive for drawing (special products method). He used an English version of the poem *Hans Guck-In-Die-Luft* (Johnny Look-In-The-Air) from the book *Der Struwwelpeter* (Slovenly Peter) (Hoffman, nd). This specific products method was used subsequently by S. Partridge (1904) in England and by Levinstein (1905) and Lamprecht (1906) in Germany.

At approximately the same time Barnes was conducting his first studies, Arthur Clark (1897), in California, set about to study children's difficulties with drawing perspective correctly. Clark collected over 7,000 drawings by asking children to draw an apple with a hat pin stuck horizontally through it and an open book lying upside down on a table. Clark was able to report how children reacted to these observational drawing assignments and the extent to which children draw what they see or what they know when they are able to observe an object. Hilda Lewis (1973) replicated Barnes' pin-through-the-apple study as recently as 1972 and it remains one of the few published, deliberate replications of earlier work in contemporary art education literature.

Early classification systems have been praised as "possibly the most important single contribution to the early period of research on children's drawings" (Harris, 1963, p. 17). Ebenezer Cooke described a scale of children's drawing development as early as 1885. Burt (1921) devised a seven stage developmental sequence in which "progress in drawing shows successive changes in kind as well as degree" (p. 318). Cooke's (1885) and Burt's (1921) stages, with clearly described sub-stages, predate major efforts by American art educators to describe other developmental sequences in art.

Nearly all the research previously described was carried out without theoretical bases and/or systematic preconceptions or hypothetical questions as rationales for the investigations. This research did contribute, nevertheless, an inordinate amount of information relative to understanding the nature and development of children's drawings. A major contribution and major change occurred when, in 1913, Edward L. Thorndike published the first "standardized" test, his *Scale for the Merit of Drawings By Pupils 8-15 Years Old*. By introducing tests, Thorndike ushered in a major change in the study of children's drawings and art abilities. Obviously, the types of inquiry and research based upon collecting and analyzing children's drawings did not stop but was augmented and acquired a new dimension. Most of the previous inquiry specifically focused upon drawing ability or the analysis of drawings to derive other information. With the introduction of testing art abilities, or perhaps merely simultaneously to it, the study of children's drawings was expanded to include a myriad of other art-related abilities.

Testing

It isn't necessary to report that tests are commonly administered in the schools of the United States and that the results of tests are used for many purposes. This was not commonly true, however, until just over 60 years ago (Cronbach, 1960). The use of tests began casually with idiosyncratic test development; "the testing 'industry' of today had informal, even casual, beginnings" (Cronbach, 1960, p. 97). It was not until after World War I that large-scale test publication became popular that was based upon comparison of scores to national norms. Such tests were "standardized" with large-scale representative populations. This was not always true and early test development began when "a psychologist or physician wanted to observe some type of motor, intellectual, or emotional behavior and chose a stimulus or task which he thought gave a good opportunity for observation" (Cronbach, 1960, p. 97). As individuals publicized new tests, through articles or books, others requested the tests and copied techniques or procedures used by the original authors.

It is important to define the term *test* in its generic sense and to distinguish between types of tests currently used. Cronbach (1960) defines a test as "a systematic procedure for comparing the behavior of two or more persons" (p. 21) and is quick to point out that this definition is very broad and includes all means used to collect comparative data. It is *not* restricted to measuring instruments. Tests, in this broad conception and definition, may be thought of as encompassing standardized tests, informal instruments, and non-test measures (Clark and Zimmerman, 1984). *Standardized tests* are those that require common procedures, apparatus, and criteria for scoring such that "precisely the same test can be given at different times and places" (Cronbach, 1960, p. 22). Informal instruments are less formal and fail to control procedures, apparatus, or scoring and their results at different times and places are idiosyncratic. Teacher-made tests, for instance, may be used by no one else and their design is, therefore, wholly informal. *Non-test measures* may be very important to collection of critical data, but do not comply to the popular image of tests. These may include the collection of biographical data, academic grades, or ratings on behavioral scales.

Early tests of art-related abilities were informal and idiosyncratic. One of the first, perhaps *the* first, was Thorndike's *A Scale For The Merit Of Drawings By Pupils 8 To Fifteen Years Old* (1913, pp. 1-39) (see Figure 1). Thorndike was aware of the studies reported previously and was concerned by their lack of standardization or theoretical bases. He attempted to establish a graded scale that teachers could use to evaluate children's drawings with some commonality.

> It is the purpose of this number of the [Teachers College] RECORD to present a provisional scale by which achievement and improvement in drawing can be measured with somewhat the same clearness, exactness, and commensurability as achievement and improvement in lifting weights, and to illustrate some of the uses of such a scale (Thorndike, 1913, p. 4). The scale will be of service wherever the merit of the drawings of any child or group of children is to be compared with the merit of the drawings of any other child or group of children or with the drawings of the same child or group of children under other conditions. (Thorndike, 1913, p. 17)

Obviously, this scale was intended to function as a test as defined by Cronbach. It was, however, developed idiosyncratically and was based upon Kerschensteiner's earlier inquiry into children's drawings. Thorndike added a new dimension, not used previously, of inter-judge agreement. He sent copies of fifteen children's drawings to artists, art supervisors in schools, and students of education and psychology. He asked them to

> arrange the fifteen reproductions enclosed in order of merit of drawings and to record the results of your arrangement (on a scale of 1 to 20) . . . In ranking these drawings, do not make any allowance for the apparent age or training of those who drew them, but consider them all by the same standard; rate them for their intrinsic merit as drawings. (Thorndike, 1913, p. 21)

On the basis of such ratings, Thorndike established that specific children's drawings differed from one another by specific, quantifiable degrees of difference.

Three years later, Thorndike introduced his *Test of Esthetic Appreciation* (1916). In these, he attempted to establish "means for measuring esthetic appreciation with a wide range of content, both for theoretical study of its nature and correlations, and for such practical purposes as tests of instruction or vocational guidance" (Thorndike, 1916, p. 509). In these simplistic

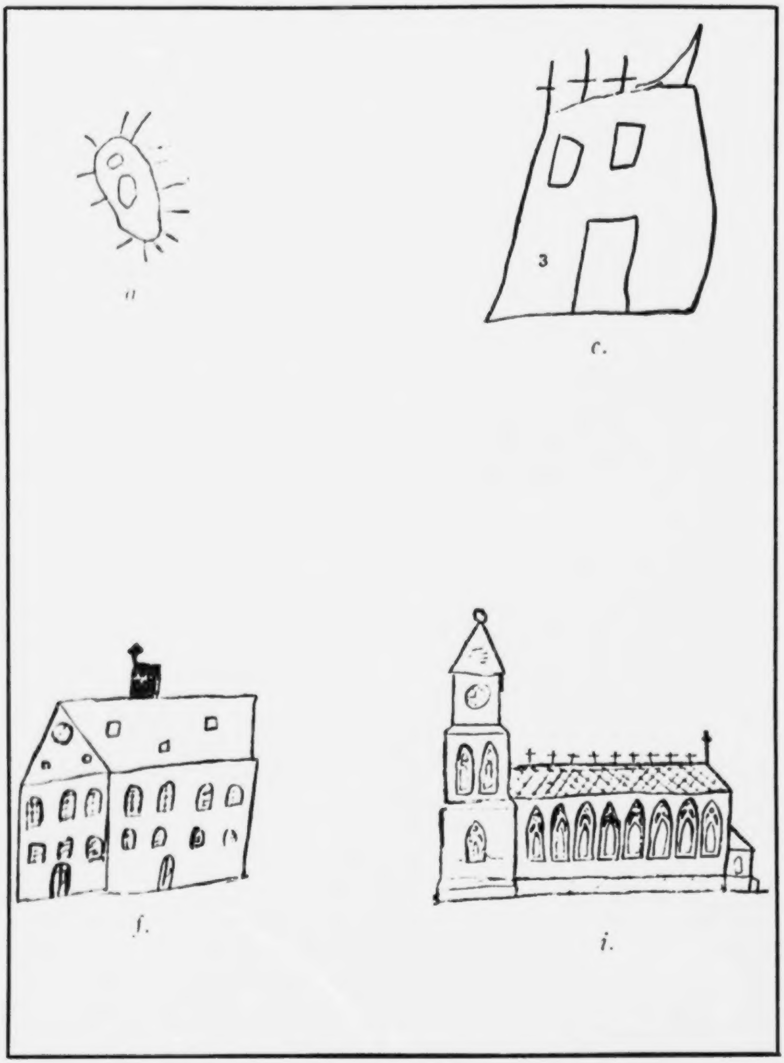


Figure 1. Thorndike's Scale for the Merit of Drawings by Pupils 8 to Fifteen Years Old (Four selected images)

tests, subjects were asked to rate the relative aesthetic merit of ten rectangles (in two groups of five), eight crosses (in two groups of four), and twelve designs (groupings of lines within enclosed spaces), in three groups (see Figure 2). They also were asked to match lines of poetry and their scores were based on the rankings of judges.

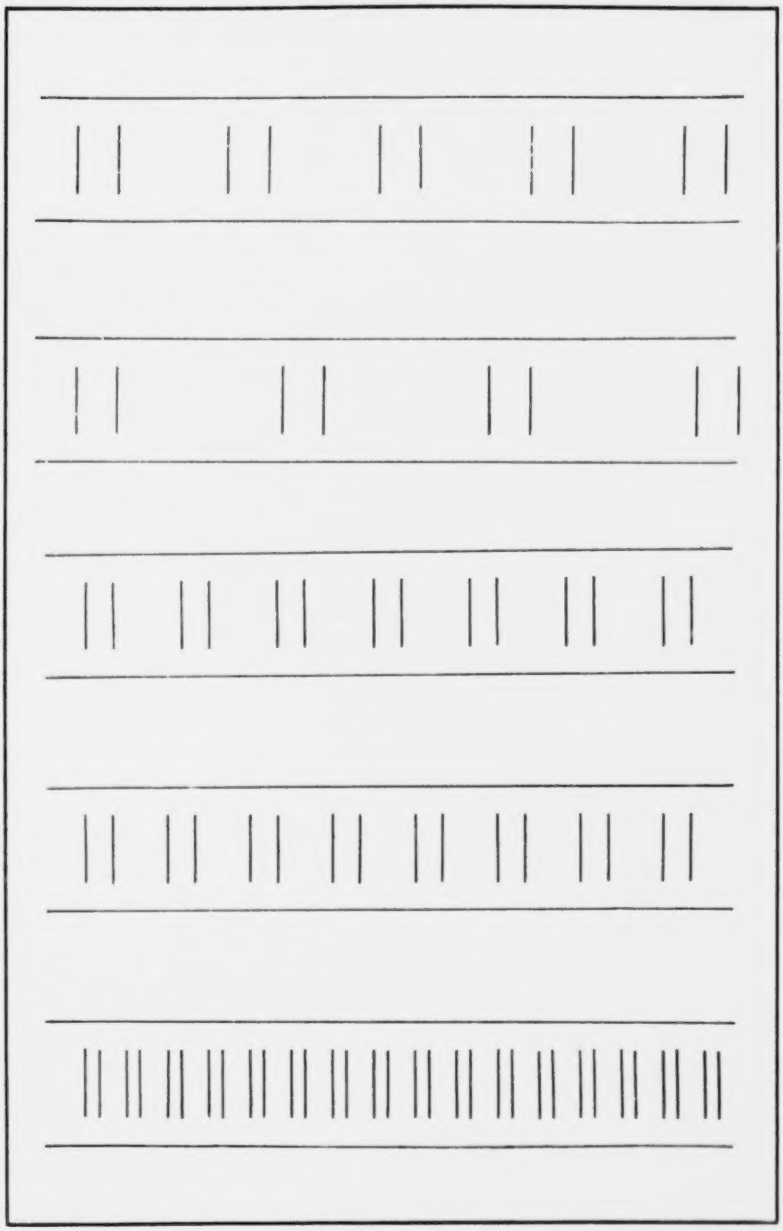


Figure 2. Thorndike's Test of Aesthetic Appreciation (Sample display)

Thorndike's article set forth "means for measuring aesthetic appreciation" (1916, p. 509) and encouraged others to use it for theoretical studies and practical tests of instruction. That this was done is apparent from studies such as Childs' (1915) "Measurement of the Drawing Ability of 2,177 Children . . . By a Supplemented Thorndike Scale." Childs set out to determine growth in ability from grade to grade, norms of ability for each grade, limitations of Thorndike's scale in actual use, and administrative problems associated with testing in schools. He reported that "there is no longer any serious question as to the advantages of objective scales for measuring school achievement in art" and that "it is desirable that the teacher or supervisor of drawing know what quality of achievement the pupils of any grade should attain" (1915, p. 403).

Thorndike was a major figure in the development of psychometrics and testing in the United States and was especially interested in children's art development. As a result, in 1913 and 1916, he contributed some of the first art tests ever used in this country. Within three years, Whipple (1919) and Manuel (1919) reported their studies of childrens' general abilities and art abilities based upon extensive testing of students in the schools of Champaign, Illinois. Guy Whipple set out to test the value of testing:

> It will be understood, then, that our procedure was empirical. We drew up at the outset a lengthy list of tests and fired them, if the comparison may be permitted, like a charge of buckshot, to see which ones hit the mark. (Whipple, 1919, p. 14)

Whipple "fired" 85 different tests at a group of selected students in the schools of Champaign, Illinois. The guiding question for Whipple's study was "what mental tests are most valuable in selecting from ordinary public-school classes bright pupils for training in special classes for gifted students" (Whipple, 1916, p. 7). He was able, after two years of study, to recommend that six group tests could be used to efficiently identify and select gifted students from a general school population.

This recommendation may seem simplistic, but it was not possible until Whipple tested the myriad of available tests, in 1916 and 1917, to determine their effectiveness or efficiency. This type of research was new and untried at this time. Few of the tests Whipple used were standardized across large, school-age populations or based upon wide-scale use. They were largely new and idiosyncratic at that time. What Whipple was able to do, however, was to offer 18 realistic recommendations about teaching gifted students. These may not be applicable at the present time, but were highly useful for teachers and program directors in 1919.

Herschel Manuel was one of Whipple's research assistants and wrote the last chapter in Whipple's book. The chapter was entitled "An Analytical Study of Talent In Drawing" (Whipple, 1919, pp. 126-147). The last six pages of this chapter are an annotated bibliography and include numerous references to the literature of the study of children's drawings cited previously. Manuel authored a separate book, also published in 1919, that specifically focused upon his study as part of Whipple's research. His title clearly expressed a focus upon tests and their evaluation.

Talent in Drawing: An Experimental Study Of The Use Of Tests To Discover Special Ability is a remarkable document, especially in light of its publication in 1919. In the introduction to the text, Manuel stated his purposes clearly:

> It is the purpose of this volume to report the results of a study of talent in drawing. If it may not seem too abrupt, it will give point to the presentation around which the research has centered. This problem is two-fold: (1) What are the essential psychophysical characteristics of persons talented in drawing?
>
> (2) How may the test method be used in the diagnosis of talent in drawing? (Manuel, 1919, p. 1)

He also clarified the nature of tests and the basis of his (and Whipple's) dependence upon tests as a legitimate basis of research.

> Within itself the test is diagnostic rather than theoretical. Its purpose is 'to analyze, measure and rank the status or the efficiency of traits and capacities in the individual under examination' [quoting Whipple (1919)]. Its value as an instrument of research lies in the use which may be made of these measures, analysis, and ranks. It is a kind of standardized experiment in which the meaning of the performance is determined by previous research or else by comparison with other results. (Manuel, 1919, p. 3)

Manuel began his discussion with the above statement of the problem, a justification for the study, and a very brief review of previous research. This was limited, unfortunately, to a review of the work of Binet (1908), Kik (1908), and Kerschensteiner (1905), although, in his analysis of conclusions, he also cited the work of Albien (1908), Meumann (1914), Ayer (1916), and others. As shown above, these earlier studies were idiosyncratic and did not use testing as a research tool. Manuel justified his own (as well as Whipple's) reliance upon test results with the following proviso:

> It is to this newest phase of the development of experimental methods in psychological study that this investigation belongs. Despite the uncertainties involved, science must use even the imperfectly developed instruments which it has. In doing so, not only will it advance in the immediate direction of the given research, but it will at the same time be perfecting its instruments. (Manuel, 1919, p. 7)

Even though, as Manuel pointed out, "experimental psychology is still very new" (1919, p. 6) or that "psychological experiment(s) began to be standardized into so-called tests" (Manuel, 1919, p. 6), he was willing to use a battery of newly developed tests as the primary basis for his investigation. These included a few standardized tests and a large number of idiosyncratic tests:

- I. Tests of General Intelligence
  - A. The Binet-Simon Tests
    - 1. Memory for digits
    - 2. Designs
    - 3. Sixty Words
    - 4. The Clock Test
    - 5. Vocabulary
    - 6. Interpretation of Fables
    - 7. Code
    - 8. Problem of the Enclosed Boxes
    - 9. Paper Cutting
    - 10. Logical Memory
- II. Tests of the Higher Thought Processes
  - A. Linguistic Invention and Language Ability
    - 1. Word Building (Whipple)
    - 2. Language Tests (Trabue)
    - 3. Invention of Words (Winch)
  - B. Apprehensions of Verbal Relations, or Controlled Association
    - 4. Hard Opposites (Henry)
    - 5. Analogies (Whipple)
  - C. Invention of Graphic Forms
    - 6. Ink-Blots (Whipple)
    - 7. Pictorial Imagination (after Rossolino)
  - D. Understanding and Reasoning
    - 8. Directions (Woodworth and Walls)
    - 9. Equivalent Proverbs
    - 10. Arithmetical Reasoning (Bonser)
    - 11. Reasoning (Thurstone)
  - E. Mental Manipulation of Spatial Forms
    - 12. Hand Test (Thurstone)
    - 13. Spatial Relations Test (Thurstone)
    - 14. Punched Holes Test (Thurstone)
    - 15. Painted Cube (Rugg)
  - F. Aesthetic Judgment
    - 16. Tests of Aesthetic Appreciation (Thorndike)
    - 17. Tests of Aesthetic Judgment (University of Illinois)
- III. Tests of Memory and Learning
  - A. Logical Memory
    - 20. Marble Statue (Whipple)
    - 21. Dutch Homestead (Whipple)
    - 22. Cicero (Whipple)
    - 23. Lincoln and the Pig (Whipple)
  - B. Memory For Visual Forms
    - 24. Memory For Linear Figures, With Recognition (Rossolino)

   25. Memory For Colored Figures, With Recognition (Rossolino)
   26. Memory For Pictures, With Recognition (Rossolino)
- C. Learning
   27. Substitution (Thurstone)
   28. Perceptual Learning (Judd and Cowling)
   29. Mirror Drawing - Star Test (Whipple)
- D. Imagery
   30. Questionary (Betts)

IV. Tests of Reading
   31. Reading Forward (Whipple)
   32. Reading Backward (Whipple)

V. Tests of Observation
   33. Cancellation (Whipple)
   34. Observation (Rossolino)
   35. Stamps Test (Whipple)
   36. Spot Pattern Test (McDougall)

VI. Tests of Sensory Discrimination
   37. Tests For Color Vision (Nagel)
   38. Discrimination of Differences (Author)
   39. Discrimination of Proportions (Author)

VII. General Physical and Motor Tests
   40. Tapping (Whipple)
   41. Steadiness of Motor Control, Involuntary Movement (Whipple)
   42. Aiming (Whipple)
   43. Strength of Grip (Whipple)
   44. Weight

VIII. Tests of Handwriting and Drawing
   45. Handwriting (Ayer)
   46. Drawing (Author)

In this book, Manuel described each of the 45 tests he used, results of the tests in relation to his subjects, and answers to the two questions he raised as purposes of the study. His conclusions, based upon this research, are important today because we have not had the benefit of comparable research since this very early research was conducted. Whether or not the following conclusions are viable for the present has not been tested or determined, but Manuel reported, in 1919, that:

> (1) The production of an effective drawing includes many theoretical distinguishable abilities. (p. 111)
> (2) Persons talented in drawing exhibit great individual differences in their psychological characteristics. (p. 114)
> (3) A certain elementary ability in graphic representation, such as is required for success with elementary school drawing, is independent, or partially independent, of general intelligence. (p. 117)

(4) General intelligence conditions the ability of drawers to acquire the advanced technique into which conceptual factors enter and to create original drawings of merit. (p. 119)
(5) Linguistic ability and talent in drawing are related only from the point of view that general intelligence and talent in drawing are related. (pp. 120-121)
(6) The motor ability which underlies talent for drawing is specific rather than general; talent for drawing does not presuppose a general motor superiority. (p. 121)
(7) Achievement in handwriting and ability in drawing are relatively independent of each other. (p. 122)
(8) There is an elementary drawing ability which exists apart from a general flexibility of motor habit. (p. 124)
(9) The ability to discriminate fine difference in visual magnitudes varies in persons talented in drawing; the measurement of this ability is of value in a determination of the factors of drawing ability regarded as a complex. (p. 124)
(10) While persons who are talented in drawing exhibit considerable individual differences in tests of observation, these tests appear to have some diagnostic value for talent in drawing. (p. 126)
(11) Our 'introspective' records do not support the view that superior clearness of visual (or kinaesthetic) imagery is essential to talent in drawing. (p. 128)
(12) Tests of the memory for visual forms have value in determining the characteristics of one's drawing ability; but one may have a certain ability in graphic representation without good memory for visual forms. (p. 128)
(13) Persons talented in drawing show wide individual differences in their power mentally to manipulate spatial forms; tests of this ability are of value to determine in detail the nature of the drawing talent. (p. 129)
(14) No clear relation is apparent between ability in drawing and the invention of graphic forms which was required in our tests. (p. 129)
(15) Quality of performance in graphic representation and quality of performance in aesthetic judgment are independent, or at least partially independent variables. (p. 131)
(16) Interest may indicate either a superior innate ability or merely a high development of a rather ordinary endowment, but it is of immense practical importance as an index of the energy which one is willing to expend in the development of one's ability and in practical achievement. (p. 132)
(17) There is no one psychophysical constitution for talent in drawing; the essential characteristics vary with the type of talent possessed. (p. 132)
(18) The following characteristics, each an independent or partially independent variable, seem closely related to ability in drawing:
    (1) The ability mentally to note a visual form, and, by certain lines and area, to reproduce it or significant features of it.
    (2) Ability to observe.
    (3) Ability to select from a complex visual situation the most representative and the most beautiful aspects.
    (4) Memory for visual forms.
    (5) Ability mentally to manipulate visual forms.

(6) Ability to control hand movements in accordance with visual percept or image.
(7) Ability to invent, to bring together into new artistic combinations the elements of different visual experiences.
(8) Ability to judge the beautiful in line, form, color, and composition.
(9) Ability to discriminate differences in color.
(10) Ability to discriminate differences in visual magnitude.
(11) Acuity of vision.
(12) Interest in the act and products of drawing.
(13) General intelligence.

All of the above was offered, with explanatory text for each conclusion, as an extended answer to Manuel's first question: *What are the essential psychophysical characteristics of persons talented in drawing?* The answers reported were derived from analyses of test results and observations.

Manuel's second question was, *How may the test method be used in the diagnosis of talent in drawing?* His research was based wholly upon reliance on testing ("the test method") as a means of gathering data and he offers no rationale other than to say, "The test method needs no defense, its scientific validity is well established" (p. 134). At this time, we may not be so sure that test-derived findings are that dependable, but Whipple, Manuel, and others were confident that tests were both useful and dependable aspects of a general education program and an art program.

Like Whipple, Manuel looked back critically at his testing program and the tests he used and developed a set of recommendations about a test program relative to measuring talent in drawing. Manuel (1919) recognized that ability in drawing is a very complex activity, it can be analyzed into many components or variables, and that no single description of ability in drawing is possible. He, therefore, reported the following conclusions and recommendations:

(A) A diagnosis of talent in drawing must be based upon an analysis of the talent and a measurement of the constituent psychophysical factors.
(B) The following program of tests is recommended for the diagnosis of talent in drawing [Manuel noted that the order of the tests is not significant]:
  (1) Tests of the elementary ability to represent, by lines and areas, figures and objects observed.
  (2) Tests of the ability to observe.
  (3) Tests of the ability to select from a complex visual situation the most representative and the most beautiful aspects.
  (4) Tests of the memory for visual forms.
  (5) Tests of the ability mentally to manipulate visual forms.
  (6) Tests of the ability to control hand movements in accordance with visual percept and image.
  (7) Tests of the ability to invent, to bring together into new artistic

combinations the elements of different visual experiences.

(8) Tests of the ability to judge the beautiful in line, form, color, and composition.

(9) Tests of the ability to discriminate differences in color.

(10) Tests of the ability to discriminate differences in visual magnitude.

(11) Tests of acuity of vision.

(12) Tests of general intelligence (pp. 135-136).

Obviously, most of these recommendations follow directly from findings reported earlier. Manuel was willing to use tests as a primary means of diagnosing talent in drawing, though he was cautious about how test results were used and analyzed. He was careful to state that test result interpretation required "standards of achievement with which the performance of a given individual may fairly be compared" (p. 136). In other words, test results for any given individual have meaning only in relation to scores made by all other subjects who have been administered the same test. Manuel also cautioned that every child should be given multiple opportunities in drawing because this will "accentuate the individual differences" (p. 137) and children "will tend even more to exhibit that talent where the tests for diagnosis are given" (p. 137).

Manuel recommended, and others have noted recently, that "biographical and personal data of a non-experimental character should be used to assist in the diagnosis of talent in drawing" (p. 137). Though he doesn't spell out the particular data to be examined, Manuel says the presence or absence of other interests, heredity, and home influences are important to consider. Manuel also noted that various types of tests of other abilities should be administered because people differ in their interests and abilities. Finally, he recommended that some tests be designed that would yield evidence of possibilities of improvement in any given drawing factor. As he pointed out, "it is one thing to test an ability for the purpose of finding its present strength, and quite another to test it for the purpose of estimating how much it is capable of improvement" (p. 138).

Subsequent Research and Test Development

Whipple and Manuel published the results of their test-dependent research in 1919. Within the next 23 years, more than 15 new art tests appeared that were intended to measure and/or diagnose talent in drawing and other art-related abilities. Inquiry about drawing abilities and other art-related behaviors, such as aesthetic preferences or favored subject matters, continued to be carried out without reliance upon tests. The years 1919 to 1942, however, were a period of intensified test development in art-related skills and abilities in the United States. During this time a number of researchers developed new tests that, in some cases, are still used today in revised form:

Date	*Author*	*Test Title*
1919	Whitford, W.G.	Whitford Appreciation Test
1923	Kline, L.E. & Carey, G.L.	Kline-Carey Measuring Scale for Freehand Drawing
1924	Goodenough, F.	Draw-A-Man Test
1924	McCarty, S.A.	McCarty Drawing Scales
1926	Goodenough, F.	Goodenough Drawing Scales
1926	Christensen, E.O. & Karwoski, T.	Art Appreciation Test
1927	Lewerenz, A.S.	Lewerenz Tests in Fundamental Abilities in the Visual Arts
1929	Meier, N.C. & Seashore, C.	Meier-Seashore Art Judgment Test
1929	McAdory, M.	McAdory Art Test
1932	Knauber, A.	Knauber Art Ability Test
1933	Lark-Horovitz, B.	The Seven Drawing Test
1935	Knauber, A.	Knauber Art Vocabulary Test
1935	Horn, G.	Horn Art Aptitude Inventory
1937	Nicholas, F.W., Mawhood, N.C., & Trilling, M.B.	Informal Objective Test
1939	Varnum, W.H.	Selective Art Aptitude Inventory
1942	Meier, N.C.	Meier Art Tests, 1. Art Judgment

Norman C. Meier appears twice on that list, in 1929 and 1942. His career as a researcher and test developer, with a specific focus upon understanding the development of art-related talents in children, can be considered representative of the work carried out from 1919 to 1942. Test development was not as sophisticated then as it is now and, as Cronbach (1960) pointed out, testing had informal beginnings. The following sections will be used to examine Meier's career as a representative record of the informal, even casual, beginnings of test development for the measurement of art-related behaviors. Following this examination, art-related test development will be described as it has unfolded since World War II. Recommendations then will be made to guide development of tests that measure art-related behaviors as needed by schools and to further unravel the complexities that describe children's art abilities.

CHAPTER 2

Norman C. Meier's Story of Frustrations and Accomplishments

Enid Zimmerman

To any researcher doing historical inquiry, an ultimate find might be unpublished letters and manuscripts that cast light on the personality or thought processes of a person under scrutiny. In the unpublished, undated private writings of Norman Charles Meier, a wealth of information can be found about his feelings of longing and frustration. Near the end of his life, he wrote many pages that he probably hoped to publish at a later date. We were lucky to have them at our disposal in The University of Iowa Archives.

Meier wrote these in personal statements about his own life. He described life as

> man's persistent goal-seeking both when he attains the love object or does not and then substitutes a sublimation leading to great attainment for posterity . . . Surviving the risks of war, illness, cancer, mountain climbing hazards, auto collision, frustration at stages in his personal career he steadfastly persists with consummate patience and forbearance toward his cherished goals, which are eventually realized, culminating in remarkable events during later years when others give up or retire . . . In this story there are no murders, no divorce, no one is hurt irretrievably—only deep frustrations that are one by one overcome . . . This is a story which may not be read without the reader feeling better for having read it and with a renewed faith in the nobility of man. (Note 1)

Early Years

Meier wrote about his background, in the third person, as if he were looking back years later and analyzing aspects of his life. Meier's story began during the Civil War and focused upon two brothers born in Ohio. One, his grandfather, went to a small mining town in Colorado and studied law and eventually worked in banking. He married and had a son and daughter. The son, Meier's father, married the daughter of a Presbyterian minister and they settled in the small town of Carrolton, Missouri, where the family manufactured buggies and farm wagons. This couple had two sons; the younger, Norman Charles Meier, was born on February 22, 1893.

The family later moved to Kansas City where Norman's older brother went to work and Norman continued his schooling through high school. After high school, in 1914, he went to work for the U.S. Topographic Service as a draftsman, producing maps for the Surveyor General's Office in Olympia, Washington (Note 1).

Meier wanted a college education to study social science. He had a seven year plan for which he was prepared to work and go to "the best university offering the education he needed for success . . . two years at work and on to college for the doctorate degree" (Note 1). He saved enough money and, in 1916, went to the University of Chicago. It was there that he met Margaret Haggott when both were freshman.

He was 24 years old, in 1917, when he left for the army. Meier described, in his private writings, that he went to France and served for two years as a trained specialist in the Army Engineer Regiment. During this time, he and Margaret carried on a two-year correspondence. When he returned from military service, in 1919, he found that Margaret was engaged to be married. Very disappointed, Meier did not date for the next three years (Note 1). After he received three degrees from the University of Chicago (his BA in 1920, his Ph.B in 1921, and his MA in 1922), Meier married Clea Mary Grimes, in 1923, when he was 30 years old. He felt that "after many years of deprivation of female companionship . . . time was running out" (Note 1). They had two children, one became an accomplished geologist and scientist and Meier often wrote of this son's accomplishments in his correspondence.

In 1964, forty-six years later, when Meier was 71, he met Margaret Haggott's husband, Richard Foster Flint, a geologist, and left a cordial note for her and she returned a cordial greeting. Privately, Meier wrote that his wife Clea is "the girl who became the embodiment of your [Margaret's] image that will be with me forever" (Note 1). He still treasured Margaret's letters and memory. He tried to arrange for Margaret and her husband, Dick, to meet him and his wife, Clea. The meeting never took place. Meier did note, in his private writings, that he looked up Dick's biographical entry in *Who's Who* and that it was the same length as his (Note 1). The blatent implication is that even though he had lost his first love, at least he had worked hard and reached a level of professionalism equal to that of the best scientists, including her husband's. The pattern of a quest, losing the object of the quest, and continuing to march on despite frustration and being outcast became a theme in both Meier's professional and personal lives. The problem cast large can be seen as the lowly status of the study of the visual arts and art talent in a more technologic, empirically oriented world of the behavioral sciences. Meier continued, to the end of his life, to strive for recognition through his research in large scale sampling and special ability studies. His story is described in letters, memos, and other correspondence, as well as his private writings.

The University of Iowa

In 1922, Meier had an assistantship in the Department of Psychology at The University of Iowa. He officially joined the faculty in 1923 as an Instructor. From 1925 to 1927, he was an Assistant Professor in the Psychology Department and received his doctorate in 1926. He was an Associate Professor during the years 1929 to 1954 and became a full Professor only in 1954, after serving as associate professor for 25 years.

Carl E. Seashore was Dean of the Graduate School at The University of Iowa when Meier was studying and was head of Meier's dissertation committee. Seashore was an honored scholar, known as an authority on special problems of music and visual arts, medicine, and education as well as a specialist in the field of psychology of hearing. Meier's background in topography led to an interest in studying special art abilities. He was the only one of Seashore's former students to write about art ability in the 1928-1929 Seashore commemorative issue of *Psychological Monographs* (Miles and Starch). Meier's article in the issue, "A Measure of Art Talent," was based upon his dissertation topic, *The Use of Aesthetic Judgment in the Measurement of Art Talent* (Meier, 1926). In 1930, Meier and Seashore developed the first Meier-Seashore Art Judgment Test.

Meier was director of the Genetic Studies of Artistic Capacity, at The University of Iowa, between 1929 and 1939. Meier received grants from the Spelman and Carnegie Foundations to study early art ability and growth of aesthetic sensitivity and creative imagination. He worked with over twenty research assistants, from the Departments of Art Education, Fine Arts, Child Psychology, and General Psychology during this 10 year project.

In 1930, Meier was elected a Fellow of the American Association of the Advancement of Science. He edited three volumes of the American Psychological Association's *Psychological Monographs*, in 1933, 1936, and 1939, devoted to the psychology of art. The studies reported were by Meier and his students who were working on the Genetic Studies of Artistic Capacity, as part of the Spelman-Carnegie grants. During the years 1935 to 1958, Meier was a contributor to five different yearbooks about various aspects of educational psychology.

By 1937, however, there was an evident lack of interest in, and support for, the psychology of art and music at The University of Iowa. Seashore had only one or two research assistants, whereas a number of years before, Seashore's research staff had been much larger (Note 2).

Meier also had a background and interest in public opinion polling and sampling theory. In 1931, George Gallup, a former Meier student and founder of the Gallup Poll, nominated Meier to be on the board of public advisors for the American Institute of Public Opinion and, in 1935, Meier was elected. By 1946, he had become Director of the Bureau of Attendance Research at The University of Iowa and was technical consultant to the Iowa Polls from 1943 to 1956. He was an expert witness for many Federal court cases involving public attitudes. In 1949, Meier was a contributor to the book *Polls and Public Opinion*. Another interest of Meier's was military psychology which was related to his research in perception and compositional analysis and, in 1943, Meier authored a book entitled *Military Psychology*.

During the 1940s, even though there was lack of support for studies about special abilities in the arts, Meier continued his art abilities research. In 1942, he authored *Art and Human Affairs: An Introduction to the Psychology* of *Art*. This book is a compilation of material covered in his psychology of art courses as well as results of studies done under auspices of the Spelman-Carnegie grants about Genetic Studies of Artistic Capacity. In this book, Meier set forth his theory of artistic capacity that had been generated from his previous 20 years of research. In 1940, the Meier-Seashore Art Judgment Test was revised and, in 1942, republished as The Meier Art Judgment Test. During 1947 to 1948, Meier was Secretary of the Division of Esthetics of the American Psychological Association and in 1950 became President of the Division of Esthetics. In the summers of 1940 and 1941, he was a visiting professor at the University of California at Berkeley and at the University of Oregon. In 1947, Meier was honored at a convocation for 25 years of service to The University of Iowa.

Meier's Record

Meier's record surely appears impressive in terms of research, service, and teaching although the administration of The University of Iowa did not appear to value his contributions. In 1943, after serving as an associate professor for 14 years, Meier requested to be advanced from the rank of associate to full professor; Kenneth Spense, then Head of the Psychology Department, sent a letter in response to Meier's request to Dean Harry Newburn of the College of Liberal Arts. Spense wrote that Meier was an active researcher who put in more than the average amount of time on his research though, "He seems to have had a knack for working in little studied fields . . . highly successful persons in the field [of psychology] have not been impressed, and in some instances have been derogatory in their estimation of him" (Note 3). Spense noted that Meier's work was given greater recognition by non-psychologists than psychologists. He felt that Meier's "egotism tends to build up a hypercritical attitude toward his work with the result that his work is probably not always given its due credit." Spense ended by noting that "Dr. Meier has become a definite drag in the department. He has not attracted . . . undergraduate students in his classes . . . graduate students have not been interested in his work" (Note 3).

A month later, Spense informed Newburn that he urged Meier to seek another position (Note 4). Spense also stated that Meier asked for his salary to be raised to its pre-depression amount. In a handwritten memo that appears never to have been sent, Meier wrote an appeal of his salary status.

> It seems that whether or not I should have embraced learning theory, conducted item experiments on social behavior or followed factor analysis rather than the approach I did are extraneous considerations. I have always believed in the right of the professor to direct his energies in such a way as to yield the greatest contribution in the advancement of knowledge. (Note 5)

Meier's interest in salary equity is evident from papers in the Archives. He served as a member of the subcommittee on faculty salaries of the AAUP at The University of Iowa, from 1930 to 1950, and kept a very complete record of the proceedings of this committee. In 1949, Meier did apply for a job at Stanford University, but someone else was hired.

Leonard Feldt, Professor of Psychology of Iowa, held an assistantship at The University of Iowa in the early 1950s (Note 6). He knew Meier and found him to be "open, friendly, and to give freely of his time". By the 1950s, Meier was, according to Feldt, a "prophet without honor" and had "weak support from the psychology department". The faculty who did receive recognition all shared interests with Spense who was a behavioral psychologist with a speciality in measurement.

Meier was an active researcher in the 1950s and gave a number of international lectures and seminars. In 1950, he became a Fellow of the American Psychological Association. In 1954, at age 61, he finally became Professor of Psychology at The University of Iowa. In 1955, he received a grant from the American Philosophical Society to study creative processes of artists (Note 7). Soon after he began this study, he received a Fulbright lectureship (1956-1957) at the Sorbonne in Paris, France. He was the first American professor to be invited to the Sorbonne for an academic year. Meier lectured in French about psychological aesthetics and concepts of artistic capacity. He also lectured at the University of Liege, Belgium, the University of London, and the Musee d'Homme, Paris.

In the 1960 College of Liberal Arts Bulletin, Spense was still listed as Head of the Psychology Department at The University of Iowa and Meier was listed as teaching six courses: one for undergraduates, (*Introduction to Social Psychology*) and five advanced courses (*Public Opinion and Propaganda, Psychology of International Relations, Psychology of Art, Measurement of Public Opinion,* and *Psychology of Advertising*). The Meier Art Tests: II. Aesthetic Perception was published in 1963. Meier wrote, in the same year, that "Test III, Creative Imagination, is not yet in existence, but work is progressing on it with the hope that it will be available in late 1964 or early 1965" (Note 8). This test was never published.

Meier received an NIH grant for three years, 1962 to 1965, to study the creative processes of artists. This study resulted in a research project report, *Special Ability: Creative Processes of Artists* (1965). In 1965, Meier was still involved in doing sampling research and wrote to the Johnson Reprint Corporation that he hoped to complete an enlarged, revised addition of *Art and Human Affairs* that would be entitled *The Psychology of Art* (Note 9). From the 1930s through the 1960s, Meier described himself as an occasional painter and his work was exhibited in Omaha, Chicago, and other places.

Retirement

Meier knew that he would be required to retire in 1963 when he would be 70 years old. In the early 1960s, he applied for a number of jobs at various universities. In a letter to Neil R. Bartlett, Chairman of the Department of Psychology at the University of Arizona, Meier applied for a position as professor and wrote that although he was 69 years old "in appearance, energy-level, vitality, alertness and reactions, I am usually taken for a man in his mid-fifties" (Note 10). He stated that he was continuing grant-supported research about perception and creative processes as well as teaching two courses. He cited the fact that he received high student ratings and then referred to his major accomplishments: a pioneer in large scale sampling theory and techniques in special ability research, lecturer at the Sorbonne, membership on the Advisory Board of the Gallup Poll, technical advisor to the Gallup Poll, special consultant for a New York firm on audience reaction measurement, president of the Iowa City Kiwanis Club, and author of *Art and Human Affairs*.

In his private account of his life after retirement, Meier wrote about himself in the third person:

> He felt freed at last from teaching duties and time consuming committees and unending discussions with eager students. In a sense his creative accomplishments were his main missions in life. And there was so much yet to be done. There was no one to take over and complete them. That was a grevious consequence of university policy in the past fifteen years, which decreed that a Department Head could decide that only one main interest should receive research support. But Meier did not fall in line. (Note 1)

Meier resented his retirement which he regarded as "stupidity in attempting to shelve a creative and producing individual at or near the height of his extra-ordinary career" (Note 1). Meier wrote that he soon ignored his retirement and did part-time teaching and continued his research.

In 1963, the same year as his retirement, Meier found he had cancer. In his private writings, Meier wrote that when he learned about his cancer he felt like "a man condemned to death". He worried about his dependents, his wife and aged mother-in-law, and how they would meet expenses (Note 1). His low salary was always a concern. His letters demonstrate his pursuit of fellowships, consultancies, lectures, and jobs where he might make extra money. His meticulous expense accounts also attest to his monetary concerns. Although there were three chances in four that he would not survive a radical cancer operation, he took the chance and survived. He died four years later, not of cancer, but of a heart attack.

Reference Notes

1. Meier, N.C. Unpublished manuscript, nd.
2. Meier, N.C. Personal communication to Gilbert Bridgehouse, November 12, 1937.
3. Spense, K. Personal communication to Harry Newburn, October 16, 1943.
4. Spense, K. Personal communication to Harry Newburn, November 19, 1943.
5. Meier, N.C. Personal memo, nd.
6. Interview with Leonard Feldt, May 10, 1983.
7. Meier, N.C. (1955). Creative processes of artists. Final report to the Johnson Fund.
8. Meier, N.C. Personal communication to Evelyn Deckert, John Herron School of Art, June 14, 1963.
9. Meier, N.C. Personal communication to the Johnson Research Corporation, November 16, 1965.
10. Meier, N.C. Personal communication to Neil R. Bartlett, March 23, 1962.

CHAPTER 3

Meier's Interlinkage Theory of Special Ability: Art Aptitude of Children and Creative Processes of the Artist

Enid Zimmerman

In the late 1920s and early 1930s, when Meier was formulating his theory of special abilities and artistic capacity in children and adults, a number of psychologists, educators, and philosophers were grappling with concepts related to talent, ability, and creativity. A number of philosophers and psychologists, cited in Meier's writings, were interested in problems relating heredity factors to genius and talent, developing tests to identify art talent, and studying creativity and imagination.

Intelligence and Heredity

A factor that was discussed popularly, in the early years of this century, was the relationship between intelligence and heredity. Galton's widely read, *Heredity and Genius*, originally published in 1869, was reprinted in 1892, 1914, and 1925. In this book, Galton proposed to demonstrate, through extensive research involving 300 families, that "a man's natural abilities are derived from inheritance under exactly the same limitations as are form and physical features of the whole organic world" (p.1).

In 1916, Terman published the Stanford Revision of the Binet and Simon Intelligence Test and received his first grant in 1921 to begin *The Genetic Studies of Genius*, a study he continued for the next 35 years. In this longitudinal research, the physical, mental, and personality traits of over 1500 exceptionally gifted children were investigated with follow-up studies that continue today, to determine what kind of adults the children and their progeny had become. Early results of this research, in 1926, demonstrated that the majority of gifted children were offspring of intellectually superior parents with superior family backgrounds (Terman, 1925). It appeared that "common ancestry, common environment, or, more probably both were operating" (Terman and Oden, 1959).

Hirsch (1931), in *Genius and Intelligence*, described three dimensions of intelligence: the first dimension, *subjective intelligence* is instinctive, concrete, particular, and sensuous; the second dimension, *objective intelligence*, is abstract and theoretical. The third dimension, *coalescence of subjective and objective intelligence*, is termed *creative intelligence* and "may account for the creative processes or original productions of great men" (p. 233). Intuition, an aspect of creative intelligence, Hirsch posited, occurs more often in individuals with an IQ of 140 or more. "In respect to the hereditary nature of creative intelligence, one is either born with it or never possesses it; it cannot be made to order by educational requirement . . . but environment can greatly assist in its development" (p.239).

In Meier's theory of special ability, the particular aspect of heredity involved is "constitutional stock inheritance—not direct inheritance, in the common sense, from parents" (Meier, 1939, pp.140-141). Meier's theory suggests "a unique and peculiar *interlinkage* of factors that exhibit both inherited and acquired characteristics" (Meier, 1939, p.141). Meier's theory includes aesthetic intelligence (Meier, 1939, p.149), also referred to as general intelligence, (Meier, 1942, p.129) as one of the three factors directly related to constitutional stock inheritance.

Studies of Art Ability

The 1920s, 1930s, and 1940s were a period of active test development in the area of drawing ability. In the early part of the century, a number of new drawing tests were developed. Meumann (1912), Ayer (1916), and Manuel (1919) developed tests to identify art talent in which psychophysical, motor, drawing, linguistic, and handwriting abilities as well as intelligence were criteria used to identify art talent. Meier used these tests as sources for exploratory investigations into the nature of art talent (Meier, 1926). Other art tests such as the *Lewerenz Tests of Fundamental Abilities in the Visual Arts* (Lewerenz, 1927), *McAdory Art Test* (McAdory, 1929), *Knauber Art Ability and Art Vocabulary Tests* (Knauber, 1932), *Measuring Scale for Freehand Drawing* (Kline and Carey, 1933), the *Horn Art Aptitude Test* (Horn, 1935), and the *Selective Art Aptitude Test* (Varnum, 1939) were developed in the late 1920s and 1930s to measure art production skills, knowledge of art vocabulary, and aesthetic judgment.

Hollingworth studied the relationship between art ability and intelligence and reported in 1923 a close relationship between general mental ability and performance on a drawing test. A major study of art ability began in 1933, at the Cleveland Museum of Art, under the leadership of Munro. As a result of use of the Seven Drawing Test at the Cleveland Museum of Art, criteria for identification of art talent emerged that included art production abilities, tendencies to experience phenomena visually, intelligence and rates of learning, abilities to defend aesthetic preferences, and desire to produce art (Munro, Lark-Horovitz, and Barnhardt, 1942).

In Meier's theory, artistic aptitude is viewed as "resting upon the possession of six factors: manual skill or craftsman ability, energy output and perseveration . . . general and aesthetic intelligence, perceptual facility, creative imagination, and aesthetic judgment" (Meier, 1939, p.141). *Man-*

ual Skill is defined as related to "the kind of neuro-physical constitution that is readily adaptable to the acquisition of craftsman ability" (Meier, 1939, p.142). *Energy output and perseveration* are described as "concentration upon the task at hand for indefinite periods . . . in preference to almost any rival interest" (Meier, 1939, p.149). The factor of *perceptual facility* means "the relative ease and effectiveness with which the individual responds to and assimilates experience which has potential significance for present or future development in a work of art" (Meier, 1939, p.151). *Aesthetic intelligence* is defined, by Meier (1946), as "the possession of general intelligence with special utilization of such factors as discriminatory and spatial factors" (p.2). *Creative imagination* refers to "the ability to utilize vivid sense impressions effectively in the creation (organization) of a work having some degree of aesthetic character" (Meier, 1939, p.153). *Aesthetic judgment* is defined as "the ability to recognize aesthetic quality residing in any relationship of elements within an organization" (Meier, 1939, p.155). Of these six factors, manual skill, energy-perseveration, and intelligence refer primarily to heredity. Perceptual facility, creative imagination, and aesthetic judgment refer to "acquired nature but . . . are conditioned in their specific development by factors having a definite reference to heredity" (Meier, 1939, p.141).

"Critical factors in creativity . . . for the artist . . . may possibly be perceptual acuity and depth, aesthetic perception, creative synthesis, and aesthetic form evaluation, perhaps others" (Meier, 1965, p.2). *Perceptual acuity* is defined as "Aesthetic perception [that] involves a high degree of perceptual experience, utilizing keen observation with the objective of discerning potentials and characteristics of the perceived object beyond that of normal surface appearance" (Meier, 1965, p.5). *Creative Synthesis* refers to "organizing perceptions into an aesthetic structure" (Meier, 1965, p.11). The terms *aesthetic perception* and *aesthetic form evaluation* were not defined by Meier. It appears that their definitions would be similar to definitions of terms *perceptual facility* and *aesthetic judgment*.

Creative Expression

In the 1920s and 1930s, the term *creativity* was bandied about in the fields of psychology, philosophy, and education. Hirsch's theory of creative intelligence has been discussed. Another example is *Creative Imagination*, a book published by Downey in 1926. According to Downey, "The plastic imagination constructs . . . to the dictates of objective reality . . . The emotional imagination transforms reality so that it may become carrier . . . of the inner life" (p.22). The plastic and emotional imaginations are both types of what Downey terms *creative imagination*.

In 1926, the Progressive Education Association published *Creative Expression: The Development of Children in Art, Music, Literature, and Dramatics* (Hartman and Schumaker, 1932). This book was very popular and went through five editions, the last published in 1939. Concepts such as the creative spirit, creative impulses, and creative work were discussed in this book. The Progressive Education Movement stressed that "school should be free from arrogant authorities" (Mearns, 1939, p.18) and the child be "at liberty to do anything that he pleases, and that the result will be judged only from the point of view of his sincerity and truthfulness and not by law formulated by experts" (Correthers, 1939, p.24). It was suggested that "in the early period there is little teaching except to show the child how to take care of the material and to use his body freely as he paints" (Cane, 1939, p.43). The best the teacher could do was to act as a facilitator and provide materials and an environment in which creativity could take place.

According to Meier's theory, a person who has special ability, with reference to artistic aptitude, "starts early in life and ordinarily without adult stimulation" (Note 1). The art teacher or parent can do little to develop manual skill, energy output and perseveration, and intelligence except "to provide favorable working conditions, appropriate media, and reasonable opportunity, with perhaps judicious encouragement" (Note 1). In regard to perceptual facility, creative imagination, and aesthetic judgment, Meier did suggest that "any manner of further improving and rendering more effective these [perceptual] habits will make the art student more effective" (Note 1). His theory includes, in respect to educational intervention, "improving habits of perception," "drawing out memories of experiences," and guided study of "the way in which good compositions have been knit together" and "the functioning of principles of art" (Note 1).

In most of Meier's writings about special ability, the term *creativity* is used extensively. His theory of special ability contains the terms *creative imagination*, *creative processes of the artist*, and *creative synthesis*.

Meier's Interlinkage Theory of Special Ability

It was in an intellectual environment where giftedness was related to heredity and intelligence, art talent was related to perceptual ability, intelligence, aesthetic judgment, art making skills, and desire to make art, and where creativity was the byword for art education that Meier formulated his theory. Meier explained that:

> The interlinkage theory of special ability offers a constructive analysis of the concepts of talent, aptitude, and genius in the field of art, indicating concretely the involved interlinking of heredity, environmental and developmental factors. (Meier, 1942, p.v)

Nature and nurture were not viewed, by Meier, as separate since they

> interact in a dynamic total situation. The six factors . . . are therefore more a *series of conditions* which, when present, *interact with the energies of the*

> *individual to develop* his artistic competence. The individual therefore, not the inheritance nor the environment, is the final determiner of the situation. (Meier, 1939, p.157)

The six factors of artistic aptitude are viewed as *interlinked* and the entire dynamic process is "a closely knit, interdependent, evolving development" (Meier, 1942, p.161). Some characteristics, according to Meier, were attributable to inheritance and others to learned, acquired habits. "Manual skill, energy output and perseveration, and general intelligence refer to heredity and perceptual facility, creative imagination, and aesthetic judgment refer to learning" (Meier, 1942, p.130). The latter three factors "are conditioned in their specific development by factors having definite reference to heredity" (Meier, 1939, p.141). Meier suggested some specific interlinkages such as the interaction between manual skill and "the rapid and effective attainment of a greater and greater degree of aesthetic judgment" (Meier, 1942, p.159). He also noted that "superior intelligence conditions the rate of development and functioning of aesthetic judgment and creative imagination" (Meier, 1939, p.151).

Meier's Previous Hypotheses About Artistic Aptitude

Studies, conducted by Meier and his students about artistic aptitude in children, were based upon a number of previous hypotheses they tested and rejected or accepted in over a decade culminating, in 1939, in the acceptance of six factors related to artistic ability that contribute to art talent in both children and creative artists. Hypotheses that were tested and rejected, extended, or altered by Meier and his students included:

1. Aesthetic intelligence (sensitivity) in balance, rhythm, color harmony, and compositional unity are present in children without instruction and emerge at different ages independently of intelligence (Meier, 1934b)
2. Artistically superior children show distinctly superior performance in
    a. completeness and accuracy of observation (Meier, 1934b)
    b. visual memory (Meier, 1934b)
    c. uniqueness in imaginal construction (Meier, 1934b)
    d. originality in line drawing (Meier, 1934b)
    e. form distinction (Meier, 1934b)
    f. feature discrimination (Meier, 1934b)
    g. recreative imagination (Meier, 1939)
    h. reconstructive imagination (Meier, 1939)
    i. response to the visual world, (is more complete, vivid, and retains visual imagery longer than less talented peers) (Meier, 1934b)
    j. fertility of imagery and resourcefulness of expression (Meier, 1934b)
    k. display of a critical attitude toward own work and the work of others (Meier, 1934b)

3. Differences in motor skills and some sensory capacities between artistically talented and untalented students are not significant (Note 2)
4. Artistic capacity is not fixed at birth and motivation is an important method of instruction (Note 2)
5. The talented child is not necessarily atypical in any outward way (Note 2)

Previous Hypotheses About the Creative Process of the Artist

Meier was working on his theory of the creative processes of the artist at the time of his death. His final list of characteristics of the creative process of the adult artist consisted of four factors with the assumption that there are other factors to be considered. Among the hypotheses that were rejected, extended, or altered by Meier, after subjecting many artists to a series of tests and observations, were:

1. Artists follow individual approaches in organizing perceptions and experience into an aesthetic structure (Note 3)
2. The creative process has some elements in common to all artists (Note 3)
3. An artist's current manner at work may differ from earlier modes (Note 3)
4. No artist works without reference to prior work of art (Note 3)
5. Creative processes of artists often cannot be understood adequately (Note 3)
6. Some artists work with creative anxiety, without an end product in mind (Meier, 1965)
7. Factors of the artistic process include:
   a. objective realism
   b. subjective realism
   c. highly subjective personal experiences objectified
   d. creation of forms by re-living another's experiences
   e. creation of abstractions from the semi-conscious
   f. creation of abstractions from undetermined sources
   g. development of a single element such as color, form, value, etc.
   h. intense personal portrayal of natural objects (Meier, 1958)

Testing the Hypotheses

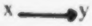
Meier and his students found new approaches for studying these hypotheses using a variety of tests that they developed or that were currently in use. They also invented a variety of apparatus such as one that fabricated aesthetic environments where the subject could control a number of factors. The ingenuity of these testing devices led Meier to accept or reject hypotheses and at times combine different hypotheses. Meier's and his students' studies, over a 40 year period from 1926 to 1966, resulted in a theory that has interest for the study of contemporary artistically talented students.

Digraph and Critique of Meier's Theory

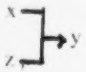
A digraph of Meier's Interlinkage Theory of Special Ability is presented in Figure 3. In digraph analysis, theories presented in narrative form can be represented formally by identifying key terms in the narrative and treating these as components. Application of digraph analysis to terms in a theory results in generation of a network of determinant relationships that can be used for analyzing and critiquing theoretical concepts as well as building new theory (Zimmerman, 1982, 1983).

The following symbols for relations between terms will be used to digraph relations between terms in Meier's theory:

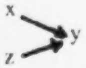
x causes y



x and z causes y



x or z causes y



Procedures such as digraph analysis, according to Mullins (1974),

> are intended as aids in the building, use and analysis of theories . . . . Formulation has the advantage of making a theory's assumptions explicit and (usually) permitting (1) the deduction of a series of statements which are implied (but not explicitly stated) by the original theory statements, and (2) the unfolding of that theory into compact form. (p.2)

Terms in the digraph in Figure 3 first were defined from Meier's later writings and then relationships between terms were diagraphed.

In the Interlinkage Theory of Special Ability, *constitutional stock inheritance* is shown as leading to three factors of artistic aptitude: *manual skill, energy output* and *perseveration*, and *(aesthetic) intelligence*. Constitutional stock inheritance is also shown as leading to *learned acquired habits* that in turn lead to three other factors of artistic aptitude: *perceptual facility, creative imagination*, and *aesthetic judgment*. The six factors of artistic aptitude are shown as linked together to form the more general term *artistic aptitude*. Four factors of *educational intervention: favorable working conditions, appropriate media, opportunity to do art work*, and *encouragement* are related to inherited factors of manual skill, energy output and perseveration, and aesthetic intelligence. Three other factors of educational intervention: *improving habits of perception, drawing out memories of experiences*, and *directed study of art principles and composition* are

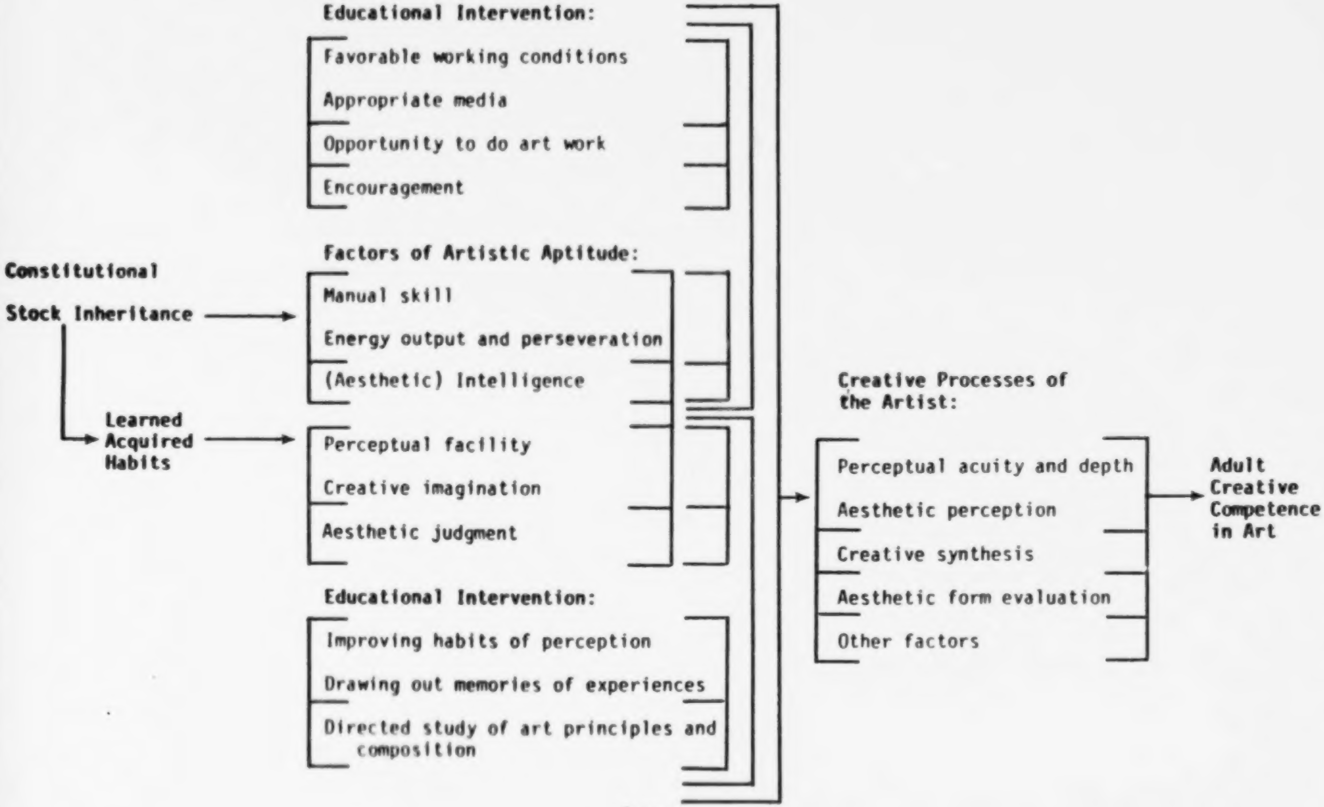

Educational Intervention:
Favorable working conditions
Appropriate media
Opportunity to do art work
Encouragement
Factors of Artistic Aptitude:
Constitutional
Stock Inheritance
Manual skill
Energy output and perseveration
(Aesthetic) Intelligence
Learned
Acquired
Habits
Perceptual facility
Creative imagination
Aesthetic judgment
Educational Intervention:
Improving habits of perception
Drawing out memories of experiences
Directed study of art principles and composition
Creative Processes of the Artist:
Perceptual acuity and depth
Aesthetic perception
Creative synthesis
Aesthetic form evaluation
Other factors
Adult
Creative
Competence
in Art

Figure 3. Meier's Interlinkage Theory of Special Ability

related to learned factors of perceptual facility, creative imagination, and aesthetic judgment.

All factors of educational intervention and artistic aptitude lead to five indicators of the creative processes of the artist: *perceptual acuity and depth, aesthetic perception, creative synthesis, aesthetic form evaluation,* and *other factors*. The final outcome of constitutional stock inheritance, learned acquired habits, factors of artistic aptitude, educational intervention, and creative processes of the artist is *adult creative competence in art*.

It should be noted that terms in Meier's theory are neither exclusive nor exhaustive nor are they necessary and sufficient. Meier (1939) conceded that "the six factors of artistic aptitude are not mutually exclusive categories but are general terms descriptive of a number of recognizable functions which overlap considerably and are not strictly independent variables" (p.14). He was not explicit about whether or not all six factors are needed for a person to have artistic aptitude. He explained, "it is not to be assumed that artistic aptitude consists in high degree in all six factors, but it is necessary that to assume that at least some of them must be present in any kind of individual who will make any kind of headway in the field" (Meier, 1939, p.156). Meier also stated that critical factors in the creative process of the artist "are few in number and these may possibly be perceptual acuity and depth, aesthetic perception, creative synthesis, and aesthetic form evaluation, perhaps others" (1965, p.2). His tentativeness in these statements implies that the six factors of artistic aptitude and the four identified factors of the creative process are by no means exclusive or necessary and sufficient.

Many terms in Meier's theory are not carefully defined. The term *aesthetic intelligence* is sometimes referred to simply as *intelligence* or *general intelligence*. *Aesthetic judgment* is often described as *aesthetic sensitivity* or *aesthetic perception*. In none of Meier's writings, is the term *creativity* defined, rather it is used loosely to describe imagination, synthesis, and art processes that are among factors that lead to adult competence in art. *Creative imagination*, for example, is defined as "a special use of imagination in which there is an effort to build up a new organization from imaginal content" (Meier, 1942, p.1138). Meier does not clarify if the new organization is new for the student who created it or if the organization has not been presented before. It would appear that the new organization should be appropriate and qualitatively different than other organizations and not just new for the student if it is to be viewed as a new or novel organization. Meier did not clarify this issue. In another place, Meier refered to creative imagination as "a stage in the process of creating a work of art" (Meier, 1942, p.156). If creative imagination is viewed as only a process it would be impossible to determine if an act of imagination is creative without viewing the end product, the new organization suggested by Meier. The term *creative*, therefore, is not well defined and does not add meaning to the term imagination, rather it confounds it. Terms such as *perceptual facility* and *aesthetic judgment* also could be labeled as creative and they are not. The same indiscriminate use of the term *aesthetic* is apparent in examination of Meier's theory. The term *aesthetic judgment* is defined by the "ability to recognize aesthetic quality." The term *aesthetic* is never defined, therefore, using it to define *aesthetic judgment* is questionable.

Meier's Interlinkage Theory of Special Ability is one that has been ignored to a great extent in contemporary research about artistically talented students. Contemporary education programs for students with superior abilities in the visual arts are proceeding without attention to a theoretical background. Meier's theory, however lacking in rigor, presents one model for formulating a theory for special ability in art. His pioneering efforts should not be ignored in studying children's art abilities and the art processes of adult artists.

Reference Notes

1. Meier, N.C. Special ability with particular reference to artistic aptitude. Unpublished paper, nd.
2. Meier, N.C. (1934a). Genetic studies in artistic capacity. Report of progress to September 15, 1934: Synopsis of preceding investigations.
3. Meier, N.C. (1956). Creative processes in artists. Paper presented at the Annual Convention of the American Psychological Association, Chicago.

CHAPTER 4

Art Talent and Research in the 1920s and 1930s: Norman C. Meier's and Leta S. Hollingworth's Theories about Special Abilities

Enid Zimmerman

Only as recently as 1972, Sidney Marland, U.S. Commissioner of Education, reported to Congress results of a five year study in which children capable of high performance in the visual and performing arts were identified as a subgroup of gifted and talented students and worthy of special attention within our nation's schools. The Marland Report contributed greatly to implementation of the Gifted and Talented Children's Education Act as part of Public Law 95-561. Categories of giftedness established in the Gifted and Talented Children's Act are:

1) *General intellectual ability* defined as across the board superiority in academics including consistently superior scores on many appropriate standardized tests.
2) *Specific academic aptitude* defined as consistently demonstrated superiority in a specific academic area.
3) *Creative and/or productive thinking* defined as superiority in original, imaginative thought processes, with fluency of idea production.
4) *Leadership ability* defined as employing a highly developed moral and/or ethical network in social interaction and having the ability to move individuals successfully through a task.
5) *Visual and performing arts* defined as demonstrated superior abilities in dance, theatre, creative writing, the arts, etc.

Research About General Intellectual and Special Abilities

How did the arts as subject areas become disassociated from general intellectual ability and academic aptitude? During the latter half of the nineteenth century, psychologists searched for laws of general human knowing to explain broad mental faculties including such abilities as memory, perception, attention, and association. These faculties were viewed as operating across diverse content areas. Binet and Simon (1905) ushered in the intelligence testing era in which complex capacities, such as those involving language skills and the ability to abstract, were used to assess intellectual capacity by ranking individuals by their combined performances on a number of diverse tasks. A debate about intelligence testing evolved, dividing those who believed in a general overriding intelligence factor, as measured by an intelligence test and those who claimed the existence of a number of primary mental faculties that are somewhat independent of each other and measurable by a variety of tasks.

Some psychologists at the beginning of the century believed that there was a positive relationship among all performances and this relationship could be termed *general intelligence*. In 1904, Spearman posited that mental traits are distributed so that ability in one is predictable from ability in another. There was, according to Spearman, a general *g* factor present in performances of an individual and a special *s* factor, that is particular to each task sampled. Spearman (1904) noted that all mental functions seemed related to a common *g* factor and a specific *s* component:

> All branches of intellectual activity have in common one fundamental function (or group of functions), whereas the remaining or specific elements of the activity seem in every case to be wholly different from that in all others. (p. 284)

Another point of view was held by Thorndike (1921), who speculated that there was no absolute coherence among all mental functions and that:

> We may indeed find factors common to all cognitive performance but not in parallel amounts, factors common to many, factors common to few, factors specific to one. (p. 149)

Burt (1921) and McCall (1922) theorized that Spearman's and Thorndike's points of view could be reconciled through acceptance of both a general factor of intelligence and specific capabilities and aptitudes. Educational attainments could be thought of as depending on a common general capacity that enters into every subject area in different degrees such as general processes that involve reading comprehension and writing logical compositions and specific capacities such as arithmetic, linguistic, manual, music, and art abilities.

Drawing as a Special Ability

By the early part of this century, some psychologists became interested in the relationship between *g* and *s* factors as they affected performance in the visual arts. Some special abilities were thought to be correlated while others showed little correlation with the *g* factor or with other special abilities. A number of studies attempted to demonstrate that aptitude in the visual arts is controlled primarily by special talents rather than by general intellectual ability (Elderton, 1909; Fishlovitz, 1903; Ivanoff, 1909). On closer scrutiny, however, the only art ability being considered was representational drawing ability. When other art abilities such as diagramming and cartooning were tested, students who were superior in these art abilities also appeared to demonstrate high general intelligence (Ayer, 1916; Kerschensteiner, 1905; Kik, 1909). Manuel (1919) claimed that drawing ability was independent, or partially independent, of general intelligence. The tests he used were memory drawing and drawing from an object, both forms of representational drawing. Manuel did acknowledge that at high levels:

> . general intelligence conditions the ability of drawers to acquire advanced technique into which conceptual factors enter and create original drawings of merit. (1919, p. 19)

By the 1930s, a number of psychologists and educators were studying and testing the relationship between general mental ability and performance on drawing tests (Cane, 1936; Fritz, 1930; Klar and Winslow, 1933; Lark-Horovitz, 1937). Psychologists, such as Goodenough who published the *Draw a Man Test* in 1926, contended that general intelligence could be determined by analyzing children's drawings of people. She did note that scores of children who possessed special art talent were similar to scores of children of equal general intelligence who did not appear to possess special art talent. Harris (1963) revised the Goodenough test to determine *intellectual maturity,* the ability to form concepts of increasingly abstract character.

There is a renewed interest in researching correlation between general intelligence and talent of all kinds. Schubert (1973) and Vernon, Adamson, and Vernon (1977) noted that high intelligence controls the development of art abilities. Inglehart (1960) and Hoyle and Wilks (1970) speculated that children with special talents may not score as high on IQ tests as those who are academically talented, but an IQ of 120+ is a prerequisite for achievement in specific areas of talent, including art talent.

On the other hand, Thurstone (1983) found no common general factor in a battery of 56 tests. He also noted that a number of primary mental faculties were separate, independent factors that could be measured by specific tasks. Recently, Gardner (1983) challenged the notion of a general factor of intelligence and posits seven *multiple intelligences* identified as linguistic, logical-mathematical, spatial, musical, body kinesthetic, intrapersonal, and interpersonal intelligences. Like Thurstone, he also believes these intelligences should be studied and tested as separate entities.

From the early 1920s through the early 1930s, lively debate between advocates of general intelligence and special talents and abilities was at its peak. Two psychologists, Letta Stetter Hollingworth and Norman Charles Meier, worked at this time. Research and concepts related to the relationship between general intelligence and art talent can be studied through the life and work of these two psychologists. Such a study can shed light on history of the current status of the visual and performing arts as a subgroup of giftedness and talent established in the Marland Report (1972).

Hollingworth's Life[1]

Leta Stetter Hollingworth was born in 1886 in Chadron, Nebraska. After graduation from the University of Nebraska, she taught high school classes for several years before moving to New York City with her husband. Married women could not teach in New York City at the beginning of this century; therefore, Hollingworth was prompted to continue her studies at Teachers College, Columbia University, where she received a Ph.D. in 1916. While completing her doctorate, she worked as a clinical psychologist, testing mentally deficient individuals.

Upon completion of her dissertation, Hollingworth accepted a position as an Instructor of Educational Psychology and as Principal of the School for Exceptional Children at Teachers College, Columbia University. She became, in 1919, an Assistant Professor of Education, from 1922 to 1929 an Associate Professor of Education, and in 1929 a Professor of Education. In 1936, she was appointed executive head of Speyer School, an experimental institution specializing in education of slow and exceptionally gifted children.

Her teaching, research, and writings, from 1916 until her death in 1939, covered a number of different, yet related, areas in the fields of psychology and education including clinical psychology and mental adjustment, social and professional status of women, intellectually gifted children, psychology and education of subnormal children, special abilities and defects, and adolescent psychology. She directed 10 major projects at Teachers College, although she was not able to obtain external funding from foundations or social agencies. She was chairperson of 26 dissertation committees and author of 9 books and 85 major articles (Hollingworth, 1943). Thorndike, known for his research about theory and techniques of educational measurement, was her dissertation director and mentor at Teachers College and influenced the theoretical bases of her teaching and research.

From 1927 to 1938, a sizeable portion of her research was devoted to studying intellectually gifted children in "opportunity classes" at Public School 165 in New York City. From 1936 until her death in 1939, Hollingworth was head of Public School 500, the Speyer School, in New York City. An innovation introduced by Hollingworth was the use of photography and movies to document the activities of children in their classrooms. Hollingworth referred to these visual records as her photographic note taking. Of special interest to art educators is her research related to intellectually gifted children and study of special abilities and disabilities including art talent. Recently, Columbia University's Center for the Study of Education for the Gifted was named the Hollingworth Preschool in her honor.

Hollingworth's Research About Special Ability

Hollingworth wrote extensively about the relationship between general intelligence and special talents in areas such as art and music. A general factor of intelligence was discussed by Hollingworth as "the positive coherence which exists among the multitudinous abilities of an individual, as respects their amounts" (Hollingworth, 1923, p. 34). Certain abilities such as reading, spelling, arithmetic, drawing, music, left-handedness, mirror writing, mechanical ability, and leadership were shown, according to Hollingworth, to be either relatively dependent or independent of the general intelligence factor. Success in music and representational drawing was shown to be very slightly correlated with success in other school subjects, whereas subjects such as reading and arithmetic were thought to be highly correlated with general intelligence (Hollingworth, 1923, p. 37). Knowledge of general intelligence, therefore, could be used to predict future success in reading and arithmetic, whereas predictions concerning a student's ability to draw realistically or sing or play an instrument could not be made with confidence. In order to distinguish these special aptitudes from general intelligence, Hollingworth (1926) referred to them as *talents*.

Hollingworth (1926) explained the lack of coherence of art and music abilities with general intelligence by the fact that these abilities involve the eye and ear to a much greater extent than abstract thinking. Art and music abilities would, therefore, be functions of "specialized anatomical structures as well as the brain and might be expected to show specialization in performance" (Hollingworth, 1926, p. 203). Hollingworth (1923, 1926, 1933) noted that Ayer (1916) and Manuel (1919) demonstrated that ability to draw representationally was independent, or partially independent, of general intelligence. These researchers did demonstrate, however, that certain kinds of drawing, such as analytic drawing, symbolic drawing, and caricature called for combination of a high degree of general intelligence and special talent. The ability to draw is complex and Hollingworth thought that it could not easily be dissected nor could individual elements be studied as in music ability research. Those who do achieve eminence in the arts, according to Hollingworth (1923, 1933), are endowed with a high degree of general intelligence as are individuals who achieve eminence in other fields. Functions of general intelligence, such as a grasp of life situations and pursuit of remote goals, are required for success in the art world as they are in other fields of endeavor. Hollingworth felt that there was a positive relationship among all of a person's abilities and that if there was not a:

> Positive relationship among an individual's performances as regards their adequacy, then we could not speak of his intelligence but would have to speak of his intelligences. (1926, p. 28)

The latter, interestingly, is the position that Gardner (1983) presently holds.

Meier's Life

Norman Charles Meier was born in 1893 in Carrolton, Missouri, and he grew up, as did Hollingworth, in small towns in the Midwest. In 1916, he went to the University of Chicago where he received a BA in 1920, Ph.B. in 1921, and MA in 1922.

Meier and Hollingworth both became professors in departments where they received their doctorates. Hollingworth moved to the East coast to complete her education and Meier moved back to the Midwest to finish his. In 1922, Meier received an assistantship in the Department of Psychology at The University of Iowa; from 1923 to 1925 he was an Instructor in the Psychology Department. Meier received his doctorate in 1926 and was named an Assistant Professor of Psychology. He was an Associate Professor from 1929 to 1954 and became a full Professor only in 1954, after serving 25 years as an Associate Professor. Hollingworth quickly climbed the ladder to become a full Professor. Meier's research about special abilities in art and large scale sampling lost favor and was not supported by his department that had become dominated by behavioral psychologists who specialized in observation and measurement of precisely defined outcomes.

As Thorndike was Hollingworth's mentor, Seashore, Dean of the Graduate School at The University of Iowa, was Meier's. Seashore was an honored scholar, known as an authority about special problems of music and the visual arts, medicine, and education as well as a specialist in the field of psychology of hearing. In 1920, Meier and Seashore published the first Meier-Seashore Art Judgment Test.

Although Hollingworth was unable to find outside funding for her research, Meier, as director of the Genetic Studies of Artistic Capacity, was funded by generous grants from the Spelman and Carnegie Foundations to study early art abilities, growth of aesthetic sensitivity, and creative imagination. Like Hollingworth, Meier directed a number of theses and dissertations that resulted from participation in his research and grants. He worked with over twenty research assistants, from the departments of art education, fine arts, child psychology, and general psychology during the period from 1929 to 1939.

Meier edited three volumes of the American Psychological Association's *Psychological Monographs*, in 1933, 1936, and 1939, devoted to the psychology of art. The studies reported were by Meier and his students who were working on the Genetic Studies of Artistic Capacity as parts of the Spelman-Carnegie grants. In 1942, he authored *Art and Human Affairs: An Introduction to the Psychology of Art* that summarized research by Meier and his students in areas related to special ability in art. Hollingworth and Meier both had a variety of research interests in a number of fields in psychology. Meier had a background in public opinion polling and sample theory. Another interest of Meier's was military research related to his studies about perception and compositional analysis.

Meier invented many elaborate instruments to test art ability, used research methodologies such as case studies and personal interviews, and did much testing of art ability in the public schools. Hollingworth also used innovative research techniques, such as keeping film records of gifted students and using case study methodology in her research. She also used students in public schools as a test population.

Both Hollingworth and Meier, often gave public lectures as well as appearing on radio broadcasts. Hollingworth's radio talks covered topics such as the difficult age of adolescence and Meier's talks helped popularize the role of art in everyone's life. It does not appear that Meier and Hollingworth ever exchanged ideas about their research; there is no correspondence from Hollingworth in the Meier Archives at The University of Iowa. Meier (1936, 1942) does refer to Hollingworth's research concerning special talents and defects although she does not refer to his work in her writings. She had formulated her research in the area of special abilities before Meier began publishing his for a wide scale audience and, therefore, may not have been familiar with his research. Unfortunately, Hollingworth died in her early fifties; Meier led a longer life, until his mid-seventies, and was able to bring many of his research projects to completion.

Meier's Research About Special Ability

In the late 1920s and 1930s, Meier was formulating his theory of special ability and artistic capacity in children and adults. In a paper, "Special Ability with Particular Reference to Artistic Aptitude," Meier (nd.) defined special ability as:

> a facility in performing a project not enjoyed to a similar degree by persons in general. The person exhibiting an aptitude for art production not only is able to do it with a high degree of success, but he usually is able to do it more easily and with greater satisfaction. (p. 2)

In 1936, Tiebout and Meier set out to study the relationship between art ability and general intelligence. They disagreed with Murphy (1933) who claimed that art aptitudes appeared to be controlled by special gifts rather than by general ability. Tiebout and Meier cited Goodenough (1931), Hollingworth (1925), Kerschensteiner (1905), Kik (1908), and Terman & Burks (1933) as supporting evidence for the belief that, of all drawing abilities, only representational drawing is not related to general intelligence. They postulated that students accomplished in other aspects of the visual arts invariably demonstrate high intelligence. After a decade of study at The University of Iowa, from 1929 to 1939, Meier (1942) found that higher than average intelligence seemed to characterize the successful artist. The Iowa studies also demonstrated that among the artistically talented students studied, IQs ranged from 111 to 166. Meier concluded that general intelligence is a factor that, when present with other factors, contributes much toward the success of an artist (1942).

As a result of the Iowa research, Meier formulated his theory of special ability in which six factors of art aptitude were interlinked (1942). In this theory, manual skill, energy output and perseveration, and general intelligence (sometimes termed aesthetic intelligence) are influenced by heredity, whereas, perceptual facility, creative imagination, and aesthetic judgment are influenced by learning mediated by hereditary factors (see Figure 3).

Comparison of Hollingworth's and Meier's Theories of Special Ability

Both Hollingworth's and Meier's theories about special ability include general intelligence as a factor that contributes to superior capability in specified areas of competence. I have digraphed Hollingworth's theory of the Nature of Abilities and Disabilities in School Children and Meier's Interlinkage Theory of Special Ability: Art Aptitude of Children and Creative Processes of the Artist (see Figure 4).

Hollingworth presented a general theory about the nature of abilities and disabilities of school children. The theory includes *antecedent factors* such as *family history, environment, physique* and *movement, and temperament and interests*. These lead to *general intelligence, special abilities and defects, character, health and opportunity*. Also included in the theory is *appropriateness of education* and factors of *individualization of curriculum, curriculum modification, teacher traits and training,* and *classroom equipment*. Appropriateness of education, general intelligence, special abilities and defects, character, health, and opportunity lead to *student status* that includes *superior, typical,* or *inferior in specified abilities*. Drawing is one of six categories of special abilities and defects noted by Hollingworth (see Figure 4). In the digraph of Hollingworth's theory, six types of drawing styles are included: *copying, representational, analytic, impressionistic, symbolic,* and *caricature*. General intelligence in Hollingworth's theory influences drawing ability to a greater or lesser degree depending upon the kind of drawing skill considered. Hollingworth's theory does not stress specified abilities in adults, although Hollingworth has indicated that general intelligence is an important factor that contributes to success of the adult artist (1923, 1933).

In Meier's theory, antecedent factors that relate to family inheritance and learned habits lead to factors related to artistic aptitude. These, along with educational interventions, lead to creative processes of the artist that result in adult creative competence in the visual arts (see Figure 3). Meier's Interlinkage Theory of Special Ability is concerned solely with art ability and includes factors that lead to both student and adult outcomes. Meier's conception of art ability is broader than drawing ability and includes manual skill, energy, perceptual facility, creative imagination, and aesthetic

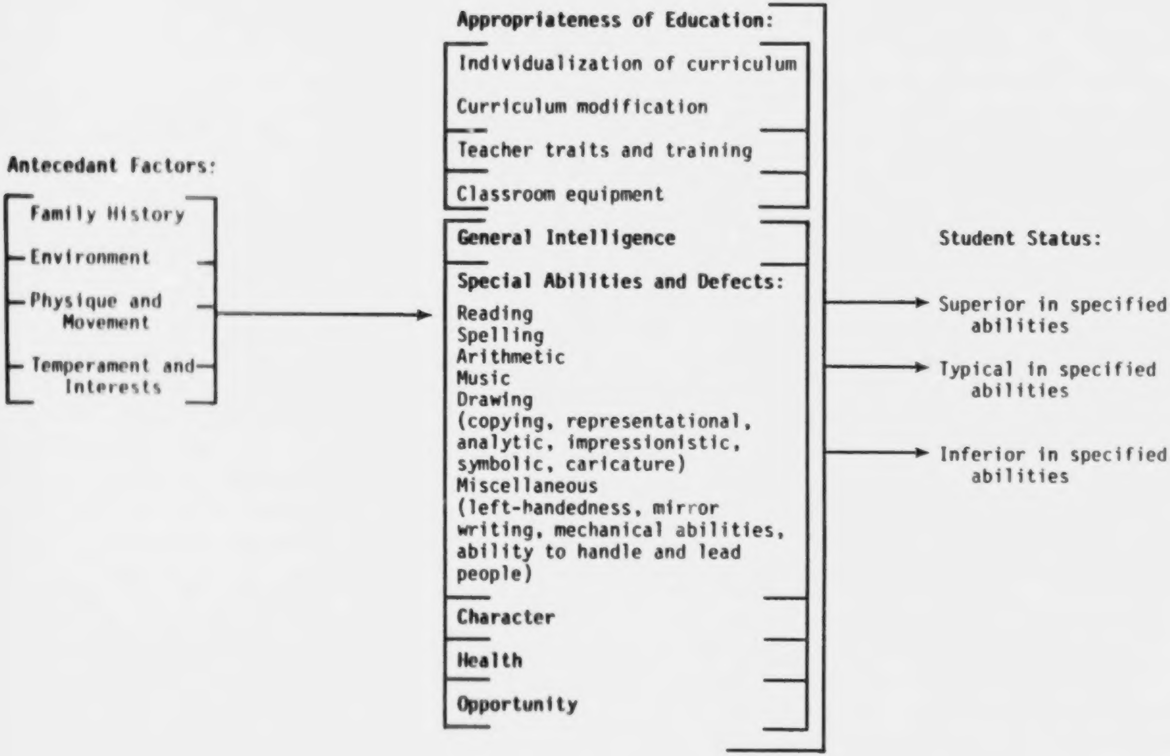

Antecedant Factors:
Family History
Environment
Physique and Movement
Temperament and Interests
Appropriateness of Education:
Individualization of curriculum
Curriculum modification
Teacher traits and training
Classroom equipment
General Intelligence
Special Abilities and Defects:
Reading
Spelling
Arithmetic
Music
Drawing
(copying, representational, analytic, impressionistic, symbolic, caricature)
Miscellaneous
(left-handedness, mirror writing, mechanical abilities, ability to handle and lead people)
Character
Health
Opportunity
Student Status:
Superior in specified abilities
Typical in specified abilities
Inferior in specified abilities

Figure 4. Hollingworth's Theory About the Nature of Abilities and Disabilities

judgment. Meier also recognized aesthetic intelligence (also termed general intelligence) as a factor included in art aptitude and not a separate factor as in Hollingworth's theory.

Art educators should note that both psychologists include education as an important factor in art development. Meier stressed appropriate settings, media, opportunities, and encouragement to do art work as well as memory training, perception experiences, and directed study of art. Hollingworth wrote generally about special abilities and defects and stressed individualization and modification of curricula, teacher training, and classroom equipment.

Summary

Examination of the history of the evolution of the *g* factor, general intelligence, and the *s* factor, special abilities, exemplified in Hollingworth's and Meier's theories about special abilities, establishes the roots of current thinking about art ability and intelligence. Although Meier theorized about the *g* factor as being an integral part of the *s* factor in art ability, Hollingworth viewed the *g* and *s* factors as separate but related to a greater or lesser degree depending on the ability under consideration.

Stress, in the past four decades, upon general intelligence testing resulted in development of successful intelligence tests for individuals and led inevitably to group and standardized tests of achievement. As intelligence tests verified degrees of individual differences, researchers began to develop similar instruments that would explain individual differences among achievement in various school subjects such as science, mathematics, social studies, and reading. The visual arts, however, have not been incorporated into any of these standardized achievement tests used by the schools because art ability still is viewed by many individuals as not related, or indirectly related, to general intelligence. Achievement tests affect organization and content of school curricula and the visual and performing arts, as areas of the curriculum, suffer inferior funding and status compared to other subjects in which gains in achievement are measured easily on group tests. Until the notion of general intelligence is made more inclusive or abandoned altogether, funding and status for the visual arts in our nation's schools most probably will continue to suffer. Until the issue of the relationship of abilities in the visual arts is researched to clarify its status as *g* or *s* factors or until intelligence testing is made more inclusive to include visual arts capabilities, the germinal work of Hollingworth, Meier, and others will remain unresolved.

Footnote

1. A more complete discussion of Hollingworth's life and work can be found in Zimmerman, E. (1985). The life and work of Leta Stetter Hollingworth. In M.A. Stankiewicz and E. Zimmerman (Eds). *Women art educators II*. Bloomington, IN: Mary Rouse Memorial Endowment.

CHAPTER 5

Norman C. Meier: A Critique of His Tests and Research

Gilbert Clark

On Monday, August 23, 1926, at 2:00 pm in the Old Capitol Building that is a major feature of The University of Iowa campus, Norman Charles Meier began his final examination for a doctor of philosophy degree. His dissertation chairperson, Carl Seashore, and six other faculty members were there to question Meier about his dissertation, *The Use of Aesthetic Judgment in the Measurement of Art Talent* (Note 1). This was four years after he had begun his studies at The University of Iowa and served as lab assistant, Instructor, and an Associate in the Department of Psychology. Meier passed his examination and, not long after being awarded a PhD, was named as an Assistant Professor of psychology at The University of Iowa. He then launched his long, controversial career researching testing and measurement of abilities in the visual arts.

The influence of Seashore on Meier was profound. We know that Meier had studied psychology at the University of Chicago, where he earned PhB and MA degrees, and, with the exception of a single course in aesthetics, continued this specialization at The University of Iowa with a psychology major and minors in sociology and social psychology. Seashore had come to The University of Iowa after helping develop one of the first experimental laboratories for psychology in the United States during his graduate study at Harvard (Seashore, 1942). He created a similar facility at The University of Iowa and guided many students into research careers in psychological measurement and experimentation during the following decades. Seashore was interested in identification and measurement of musical talent and the Seashore music tests came to be used in schools all across the country and still are today. Meier apparently sensed a need for similar inquiry and Seashore helped guide Meier's development of tests in the visual arts, an area in which Meier was interested though untrained. Seashore supported this interest and helped Meier in his early attempts at instrument development through to his dissertation research based upon administration of the first art test that Meier developed.

We know from his notes and writings that Meier evolved this first art test from many experimental versions. He started with a specific purpose, "to ascertain the feasibility of applying standard psychological techniques to the measurement of visual art tests" (Note 1). Meier described art talent as a complex function involving three general aspects: psycho-physical capacities, aesthetic judgment, and artistic inventiveness. He decided that measurement of *aesthetic judgment* afforded the greatest potential for success and adherence to psychological measurement standards and practices. His argument was that artists do preliminary sketches for their major works and use their aesthetic judgment skills to decide what sketch or combination of parts of sketches are the best and, therefore, to be used in further development of their art (Note 2). He also claimed that, though some artists deny or minimize adherence to aesthetic structure, *all* great works of art exhibit balance, stability, harmony, unity, symmetry, proportion, and rhythm successfully and that aesthetic judgment consists of being able to recognize and capitalize upon successful use of these aesthetic structures (Note 2). The key to all of his subsequent test development work is in these ideas. Meier felt that if young people and non-artist adults could make similar judgments, they would be demonstrating an important aspect of talent in the visual arts; he also felt that any alteration of the original balance, stability, harmony, unity, symmetry, proportion, or rhythm of an image created by an artist must, of necessity, result in an inferior image. Meier came to believe that measurement of art talent could be based upon recognition of such altered images as inferior and named this skill *aesthetic judgment*. Meier expressed reservations about the term as "not fully satisfactory since it implies . . . an element of logical analysis" (Meier, 1926, p.8) but hoped that his readers would keep in mind the qualification that *judgment* refers to non-logical, affective, impressionistic responses to the aesthetic organization of an image.

In fact, the measurement of *aesthetic judgment* evolved over time from a whole series of experimental projects. Meier began his inquiries by selecting pairs of images by artists that were similar in subject matter but of differing artistic merit in regard to each composition's balance. He mounted the images on cards, displayed them on an easel, and asked subjects to choose the ones they believed were best. This method of inquiry was ultimately rejected because "the results indicated no consistently favorable evidence that the model was successful" (Note 3). He then prepared sets of 10 images by artists that were judged as displaying conspicuous use of the principle of balance. These were shown to subjects in pairs and they were asked which they liked better and what features of the image influenced the decision. This method was also rejected because the results were inconclusive and because Meier felt that general intelligence and skills of logical analysis were controlling subjects' responses (Meier, 1926).

At this time, Meier made a monumental decision. He created pairs of images as line drawings in which one was derived from an artist's original image and the other an altered form of the original image that Meier believed upset the original composition or arrangement. He showed these pairs to subjects and asked specific questions that called attention to the alteration, such as "which is the better position for the stag?" (Meier, 1926, p. 19). Meier judged that "there appeared to be considerable merit in this procedure" (Meier, 1926, p. 20) and results were successful. He then experimented with the procedure; he supplied subjects with mimeographed sheets with appropriate design principles explained and with illustrative diagrams. This was given up soon as unwieldly and ineffective. He returned to the arrays of 10 images, now using one 'original' and 9 altered line drawings, and asked subjects to choose the 'best' which he always defined as the artist's original image. This task appeared to be too difficult and time consuming in this test mode.

Still experimenting, Meier created lantern slides with images of line drawings including one artist's 'original' and 3 altered drawings. The same questions and criterion were used, but his apparatus was soon questioned because "difficulties were encountered with the projection apparatus" (Meier, 1926, p. 24); the images weren't clear due to faulty focusing and the light wasn't evenly distributed, causing shadows in the corners. Presentation by lantern slide projection did not show any improvement over previous methods and, in fact, increased the difficulty, uncertainty, and non-uniformity of the experimental conditions and was therefore abandoned.

Meier decided to return to four mounted drawings shown on an easel and made two critical decisions at this time. The first was to introduce light and shade to the images, with combinations of pencil, ink, and charcoal, in order to present more accurate representations of artist's 'originals' and increase the range of possibilities for the alteration of images. The second decision was to introduce Japanese art images. These, Meier felt, exhibited the aesthetic structures he was manipulating to a marked degree, were relatively unfamiliar to American viewers, and were more readily reproduced by the media that were being used. At the same time, Meier examined results of all of his previous experiments and decided that two images (one 'original' and one altered version) were sufficient for purposes of the emerging aesthetic judgment test (Meier, 1926).

Throughout all of these prototypic experiments, drawings based upon actual artist images were used that included paintings as well as other types of art work. By this time, however, Meier decided that etchings, mezzotints, and dry point images were the most desirable images with which to start. They were found to be particularly well adapted to translation into pen and ink drawings (Meier, 1926).

Meier was now ready to create the first Meier art test of aesthetic judgment, which he did. In all, he canvassed hundreds of art works to identify appropriate images. From these, two hundred were selected and an altered version of each was created. In his own words, "A number of these were discarded after their impractibility had been demonstrated" (Meier, 1926, p.25). Ultimately, two forms of items were used: fifty tentative dual-choice items (one artist's 'original' and one altered version) and ten multiple choice items (one artist's 'original' and three altered versions). These items were drawn on a uniform 5x8 inch module, then photographed and reduced to arrays of 2×2 inch images. The test was ready to be used and became the basis of Meier's dissertation research. The test was administered to 91 high school students, 81 college undergraduates, 45 college art students, and 6 art faculty members. The results then were analyzed and reported.

On the basis of successful administration of this newly developed test, Meier sought support for a series of experiments to investigate the measurement of art talent and, in 1929, arranged for the first *Meier-Seashore Art Judgment Test* to be published by the Bureau of Educational Research and Service at The University of Iowa. The Seashore name was used, apparently, simply because it was already well known in the measurement of musical talent. We know from his correspondence and records that Meier exhorted people all across the country to use the test and send him results and that he analyzed whatever results he received as carefully as he had his original test data. On the basis of these analyses, the test was redesigned and re-issued as the *The Meier Art Tests: 1. Art Judgment* in 1940. This new name is explained in that Meier intended to produce three Meier Art Tests. The first public mention of the intention to publish three tests was in the 1940 announcement of the *Art Judgment* test and Meier referred to future publication of the other tests in many letters to colleagues (Note 3). *The Art Judgment* test had been completed and an *Aesthetic Perception* test was produced in 1963. A test of creative imagination was tentatively announced several times but apparently was never produced.

Meier's search for funding of a series of experiments to investigate the measurement of art talent resulted in a number of grants from the Spelman Foundation, Carnegie Foundation, Johnson Fund, and the Graduate Division of The University of Iowa. As early as 1927, the Spelman Foundation granted Meier funds to support research by several graduate students, and, in 1934, the Carnegie Foundation added its support to research that was underway. As a result, Meier could now expand his "Genetic Studies in Artistic Capacity."

From 1931 to 1932, the Spelman Foundation supported the research of Gilbert Brighouse, Carolyn Tiebout, Mildred Dow, Katherine Whorley, and Velma Grippen. During 1933 to 1935, both the Spelman and Carnegie Foundations continued to support their research as well as that of William McCloy, Elizabeth Buschbaum, Parmeley Clark, Constance Jasper, Eileen Williams, William Walton, Frances Rodgers, Hildegaard Dreps, Aulus Saunders, Katherine Kellett, Marguerite Clair, Ellen Clahan, and Luella Mundell. Other students who worked on various aspects of this growing research included Ethel Bouffleur Behncke, Wilhelmina Jackson, Mabel Arbuckle, May Gearhart, Walter Klar, Elmer Stephan, and William Whitford.

The work of Meier and of these graduate students was reported in three issues of the *Psychological Monographs* in 1933, 1936, and 1939, as "Studies in the Psychology of Art." Each volume reports a series of studies that, in most cases, can be found as theses and dissertations in The University of Iowa libraries. They are especially interesting in light of Meier's own description of the principles of art, written in 1926, as balance, stability, harmony, unity, symmetry, proportion, rhythm, and color harmony.

Balance

Parmely Clark Daniels tested the "Discrimination of Compositional Balance at the Pre-school Level" in a series of interesting experiments. Using three sets of matched building blocks, Daniels went into preschool and primary classes and set up two displays. One set of blocks was arranged in a balanced composition, another set was placed in random order that was not in balance, and there was a third set on the floor for children to arrange; 142 of 185 attempts by the children (76 percent) resulted in balanced compositions. Meier and Daniels both claimed this demonstrated that very young children are sensitive to and prefer balanced composition (Daniels, Note 4; Daniels, 1933-1934).

Rhythm

Constance Jasper tested the sensitivity of preschool children to rhythm in an interesting experiment. She created a series of tasks in which repeated, though relatively complex, patterns were displayed with one element missing. Subjects were asked to put one of four prepared cards into the display to complete the pattern; only one of the prepared cards would complete the pattern without disturbing the rhythm of the display. Some displays were geometric such as a repeated arrangement of diminishing size triangles; others were realistic such as a dog trotting on a background of a rolling hill. Meier and Jasper claimed that at approximately 5 years (52 to 79 months), all children become sensitive to and prefer rhythmic compositions (Jasper, note 5; Jasper 1933-1934).

Unity

Katherine Whorley tested the sensitivity of children to compositional unity in a fascinating series of tasks. Using three dimensional shapes resembling trees and shrubs, Whorley asked children to arrange these on a board on which a yard with a hedge border and a toy house already were presented in three dimensions. Each child's placement of the clay trees and shrubs was photographed and results were judged by a group of landscape architects. Meier and Whorley claimed that children younger than eight years were not sensitive to compositional unity and that most children beyond eight or nine exhibit definite understanding of the concept of unity (Whorley, 1933-1934; Meier, 1942).

Color Harmony

Both Eileen Jackson Williams and William Walton tested aspects of sensitivity to color harmony. Williams created test materials with 48 dyed China silk scarves and 12 dresses on 12 China dolls. Young children were given the dolls and fabrics to play with and notes were taken about the color combinations children created when they dressed the dolls. From this study, Meier claimed that sensitivity to color harmony appears as early as the fourth year, averages do not rise above chance until after the eighth year, and that at 12 a 'leveling off' appears that is lower than adult sensitivity to color harmony (Meier, 1934). William Walton extended this study, using the same materials, with over 700 older children and adults and developed scales showing the emergence and growth of color sensitivity over time (Williams, 1933-1934; Walton, 1933-1934).

Creative Imagination

Creative imagination had been described by Meier as a keystone of his theory of talent in the visual arts. In order to test this factor, he and several of his students created a different series of experiments. These are fascinating for their use of what we now call naturalistic inquiry methods. In contrast to the studies reported above, the creative imagination studies used highly selected subjects grouped into high ability (X group), normal (Y group), and low ability or artistically disinterested (Z group) subjects. These groups were identified from school records, study of their drawings, ratings of art interest, and time given to art activities. In addition, all the subjects were administered the *Kline-Carey Drawing Scale* (1923) as an additional check of art ability.

Velma Bookhurst Grippen conducted the first of these experiments. She established a painting interest center at a school and spent time with individuals in the X, Y, and Z groups until they were all familiar with the situation and comfortable with her. She also had a friend who would accompany her and write letters, unobtrusively, while Grippen would talk with the children as they painted. The friend was, in fact, a stenographer who was recording all teacher/student dialogue. Meier called this the *constant contact method* and pointed out that it yielded both a graphic and a written record of subjects' verbalizations of their thinking during the inception, development, and possible revision of their creative experiences. Grippen reported that by 5 years, talented children (X group) are distinguishable from others in the Y and Z groups by significant differences in their pictorial or graphic presentations, their tendency to greater self-criticism, "higher attention capacity" (which we now call task commitment), and their greater generation of ideas and images of more visual complexity (Grippen, Note 6; Grippen, 1933-1934).

Mildred Dow conducted the second naturalistic type of creative imagination study. She traced the social interactions, frequency of social contact, and the nature of activities of selected X, Y, and Z group members at two school playgrounds. This was done by a short repeated sample method; the behaviors of each subject were charted during 1-minute intervals. This study was done to test the belief that children with art skills are less active, quieter, and relatively withdrawn. Dow's hundreds of recorded observations were charted and analyzed and revealed that talented children (X group) were just as likely to run, play, interact with others, and use all other playground facilities. They also exhibited one difference from the Y and Z groups: they were more curious and made greater use of the playground facilities. Dow interpreted this to mean that they are much more interested in their visual world than their less artistically talented playmates (Dow, Note 7; Dow, 1933-1934).

Frances Rodgers conducted one of the most complex studies of creative imagination in this series. Through a complex of sources, Rodgers investigated the sources of imagery in the art work of X, Y, and Z children. The thoroughness of this research is remarkable as we look at it today. Information was gathered about each child's home, travel experiences, reading history, and family data. Working in conjunction with Velma Grippen, Rodgers traced the imagery and narratives created in the constant contact situation. For instance, a child's landscape painting of palm trees, sun, clouds, and foreground was traced to a *National Geographic Magazine* illustration found in the child's home and a 5-year-old's painting of two children on a teeter-totter was traced to an illustration in one of her mother's books. Although children in both the X and Z groups had traveled, some considerably, no Z group child depicted any travel experience in their art work, whereas 15 travel-based images were created by X group children (Rodgers, 1933-1934).

There were many findings reported for this study. Generally, it was found that talented children made greater use of their past experiences, emotional experiences, and visual memories than nontalented children. More intelligent children also created more original and fresher interpretations based upon their experiences and memories than did less intelligent children. The more artistically competent child generally came from a more permanent, visually richer environment, and had more experience reading books and looking at pictures than did the less artistically competent child, although there were some exceptions to these generalizations (Rodgers, 1933-1934).

Carolyn Tiebout extended the previous research to investigate psychophysical traits of individual children that may help explain why some are artistically talented and some are not. Subjects were paired: each X group child was paired with a Y or Z group child of the same age, sex, and approximately the same IQ. Seventeen separate tests, measures, and experiments were administered to these subjects, who ranged in age from 5 to 10 years. Sensory and motor tests, tests of memory, tests of observational skills, and tests of drawing completion and interpretation were administered. The results did identify psychophysical traits that distinguished talented from non-talented children. Talented, or artistically superior children, were found to be distinctly better at completeness and accuracy of observation, visual memory and recall, uniqueness of image construction, originality expressed in line drawings, and form and feature discrimination. Interestingly, X, Y, and Z children did not differ in motor skill development, sensory development, or color discrimination (Tiebout, note 9; Tiebout, 1933-1934; Tiebout & Meier, 1936). Meier explained that a Z child was just as likely to have good motor skills or color discrimination as an X child; these abilities alone did not produce an artist (Meier, 1942).

It is not necessary to review every experiment supported by Meier's "Genetic Studies in Artistic Capacity" in order to make a case that Meier had a fairly heavy hand in assigning problems to his students and in conduct of their research. For instance, blueprint-type drawings of equipment to be used in some of these studies, that predate the research by years, were found in Meier's archival materials in The University of Iowa Libraries. Meier obviously generated a long-range plan before he applied to the Spelman, Carnegie, and Johnson Funds and other sources of support that made the "Genetic Studies in Artistic Capacity" possible. The foundation of this program of research remained Meier's art tests that he had developed originally for his own dissertation research.

The Meier Art Tests

The Meier Art Tests (1940, 1942, 1963) have been critiqued in a number of places since they first appeared and Meier wrote quite defensively about the construction of each item even prior to their publication (Meier, note 3; Meier, 1928-1929). He must have been sensitive about criticism, or the possibility of criticism, from the beginning of his work. The test he designed and used for his dissertation research included two types of items: there were 50 dual choice items and 10 multiple choice items. These two types of items provided the basis for the *Meier Arts Tests: 1. Art Judgment* (1940, 1942), composed of 100 dual choice items, and the *Meier Art Tests: 2. Aesthetic Perception* (1963), composed of 50 multiple-choice items (see Figures 5 and 6).

Meier had written critiques of the *Knauber Art Ability Test* (1932) and the *McAdory Art Test* (1929) for Oscar Buros' *Mental Measurements Yearbook* in 1941. In turn, Paul Farnsworth and Aulus Ward Saunders (who had been Meier's student) wrote critiques of the *Meier-Seashore Art Judgment Test* (1929) in the same yearbook (Buros, 1941). Farnsworth praised the test, but questioned the construct being measured, perceiving aesthetic

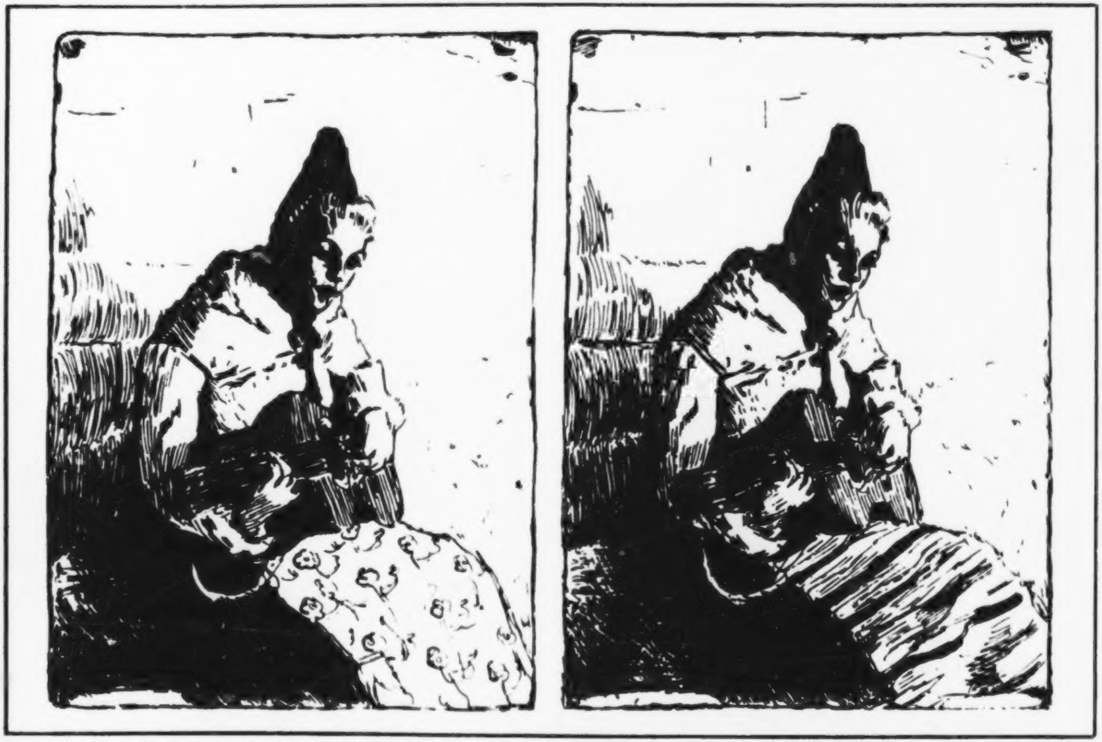


Figure 5. Meier Art Test: 1. Art Judgment (Sample item - four image comparison)

qualities or art judgment, and the assertion in the test manual that this is "the most trustworthy and significant index to talent" (p. 148). Saunders praised the test and defended testing of *art judgment* "since taste or judgment is vital in . . . art" (p. 148).

In 1949, Edwin Ziegfeld reviewed the new *Meier Art Tests: 1. Art Judgment*. He wrote that it was easy to administer and score and reliable but questioned the fact that "of the 100 plates, 94 are of paintings (or related graphic media) and the remaining six are of vases or of designs suitable for pottery" (Ziegfeld, 1949, p. 258). He then wrote that "the assumption that this test is a measure of aesthetic judgment in all areas is not proved" (p. 258) and that there is sole reliance upon factors of design and that "expression, color . . . , subject matter, and all their interrelationships, . . . enter into the making of an aesthetic judgment" (p. 258).

In the 1953 *Mental Measurement Yearbook*, Harold Schultz wrote an additional critique of the *Meier Art Tests: 1. Art Judgment*. His review reiterates *all* of Ziegfeld's claims and adds that many of the items appear to be dated, some items are aesthetically inferior, and some images are poorly drawn and reproduced too small a size to justify the task of selecting one as aesthetically superior to another (Schultz, 1953).

Figure 6. Meier Art Test: 2. Aesthetic Perception (Sample item - four image comparison)

Laurence Siegel reviewed the *Meier Art Test: 2. Aesthetic Perception* in 1972. His is an extremely negative review and challenges the scoring, validity, reliability, and use of the test. He ends by saying "Aesthetic Perception is an experimental test measuring something related to artistic ability. The nature and utility of the functions measured are not clarified by the data" (Seigal, 1972, p. 522). This is a pretty severe denouncement and it deserves some examination.

Obviously, development of test instruments is guided by vastly superior criteria and knowledge of psychometric theory and practices now than it was in 1924 when Meier began his test development; that, however, does not supply a sufficient explanation of the deficits in Meier's art tests. Meier was less careful than he should have been. His vocabulary, specifically his use of key terms and their definitions, shifted constantly throughout his work. The original validation, establishment of reliability, and even the scoring of his first test, Art Judgment, as well as the second, Aesthetic Perception, are questionable. In Meier's correspondence with artists, it is apparent that many of them challenged these aspects of the tests, though not in these words (Note 3). For instance, artists asked to rank four images of a sculpture raised such questions as "This piece of sculpture . . . cannot be judged as sculpture . . . judgment is as the most interesting photograph to me" (Note 10) or "I am not judging sculpture as such but as a monotone painting" (Note 11). One artist wrote to Meier and said, "The test is interesting but I cannot help but think that it has very little to do with the matter of education . . . art teachers . . . or painters or sculptors" (Note 12). Undaunted, even by the many artists who refused to take or analyze the test, Meier continued to use the tests with children. Even in this, he failed to use enough subjects to justify the validation and reliability claims he made. Incidentally, many of these claims were later substantially altered: for instance, he originally claimed that what his test measured was independent of intelligence. He completely reversed himself in his later writing because his students' research disproved the claim a number of times.

Criticism about the nature of the art images used, their aesthetic quality, and their justification as important or at all contemporary is heightened by learning that the "artists" cited in Meier's reliability figures for the Aesthetic Perception Test were 150 employees of the Hallmark Greeting Card Company. Similarly, scoring and norms reported for the Aesthetic Perception Test are questionable after reading a letter from Meier to a staff member at the Minneapolis School of Art. In this letter, Meier makes it clear that the 'right' answers were not established when the test was designed, but instead, were derived from answer frequencies of preliminary subjects, including the group of Hallmark "artists" (Note 13). In other words, the norms and scoring were arrived at by pragmatic calculation of answers received from the subjects that were, theoretically, being used to establish the instruments' reliability. That simply should not hap-

63

pen and cannot be justified in any way.

Similarly, early claims about the Art Judgment Test validity are open to question. In a single sentence, Meier claimed that the test's validity is based upon (1) correspondence of group score averages with degree of art experience and demonstrated ability, and (2) non-correlation of scores with extraneous factors, as intelligence and previous art knowledge (Meier, 1942). Both these claims cannot be true. In the first place, he is claiming that increased art experience and ability increases scores, in the second, that previous art knowledge has no effect upon scores. Meier's claim about the success of individual test items in diagnostic power is never explained. The test is not diagnostic and was never intended to be; Meier often claimed the test was independent of other factors indicating talent. If this is the case, what can individual test items diagnose?

Finally, scoring of the Art Judgment test was challenged by several artists, though not by formal critics of the test. Several artists wrote that specific items appeared to them to be improved by the alterations Meier had created to disturb the balance, symmetry, harmony, unity, or rhythm of images by artists. Thomas Hart Benton, for instance, wrote that "the free and arbitrary arrangements . . . are so little damaged by arbitrary changes that, it seems to me, any choice made would be aesthetically as good as another" (Note 14). In all cases, however, Meier accepted the image based upon an artist's work as invariably superior and the altered images as invariably inferior. In 1926, Meier wrote that the criterion of correctness provisionally adopted was that of "the master's own judgment" (Meier, 1926), thus implying that any non-artist's response was to be judged as agreeing (correctly) or disagreeing (incorrectly) that the artist's images are invariably superior. Meier never wrote about this problem, either in responses to artists or in reports and analyses of his work and that of his students. It appears he simply chose to ignore it, firm in his belief that the artist must, of necessity, always be right.

A Career in Retrospect

Norman C. Meier pioneered a long-term, highly complex research program about the characteristics and abilities of artistically talented children and adults. He did this with his own test development efforts and with a grand vision by which he guided the research of at least 24 graduate students in an interrelated, accumulative series of studies that helped create a complex and increasingly clear picture of the emergence and development of artistic talent in children. No such project has been executed since, and Meier deserves praise and recognition for this contribution.

He is not, however, above criticism. Like Terman, who founded the "Genetic Studies of Genius" based upon his development of the Stanford-Binet intelligence test, Meier was a pragmatist who made few theoretical, conceptual, or explanatory contributions; he gathered facts and summarized them. His own thinking was not careful and it changed throughout his career. Rather than going into his "Genetic Studies in Artistic Capacity" with the remarkable accuracy and stability that marked the work of Terman, Meier pragmatically absorbed the work of his students, and their findings often challenged his thinking and he often changed his stance in response. Meier's writings could be described as "persuasive but not often eloquent" as Gowan (1977, p. 15) described Terman's. As Terman wrote in his autobiography, Meier also could have written, "I am fully aware that my researches have not contributed very greatly to the theory of mental [or artistic] measurement" (Terman, 1932, p. 328).

Meier was a complex man. He was the teacher of George Gallup and helped launch the famous Gallup Polls. He is the person who wrote Graflex, Inc., to ask, "Consider, for instance, meeting a bear on a mountain trail on Mt. Ranier and in the Olympic Mountains. How long does it take to set up a Graflex at 1/100 second at diaphram f.11?" (Note 15). Meier devoted a large amount of time in support of an American Indian, Sioux artist he discovered in a veteran's hospital under treatment for alcoholism (Note 3). He was vice president of Iowa City's Kiwanis Club. He wrote to presidents offering his advice about world and national affairs (Note 3). He was a Sunday painter who prided himself on paintings exhibited in Omaha, Chicago, and other places. A critic of his tests, who did not know that Meier painted, wrote to Meier that he should take the writer's "painting course by mail . . . the investment of time and money will show you values which you may or may not know . . . My suspicion, to be frank, is that you do not . . . If this is so, your study is built on an irrelevant foundation" (Note 16), and so it may have been.

Meier's art tests have many faults and so did he. Yet he is to be admired for his vision of a "Genetic Studies in Artistic Capacity" research program and for guiding and directing such a program, off and on, for over 40 years. The remarkable body of information that exists due to research conducted in this program deserves more careful study today. One of his faults, perhaps, was that he was simply ahead of his time. Today, we are very much in need of a similar effort and vision. The foundations for such an effort, at this time, are already available, thanks to the pioneering work of researchers such as N.C. Meier at The University of Iowa.

Reference Notes

1. Final examination announcement of N.C. Meier, The Graduate College of the State University of Iowa, August 23, 1926.
2. Meier, N.C. (1927). Can art talent by discovered by test devices? Paper read at the Annual Meeting of the Western Arts Association, Milwaukee, WI.
3. Meier, N.C. Correspondence in the archival library, The University of Iowa.
4. Meier, N.C. (n.d.). Personal notes in the archival library, The University of Iowa.
5. Daniels, P.C. (1929). *Compositional balance discrimination by the pre-school child.* Unpublished master's thesis, The State University of Iowa, Iowa City.

6. Jasper, C. (1931). *A study of the responsiveness of pre-school children to rhythm by regular repetition in two-dimensional design forms*. Unpublished master's thesis. The State University of Iowa, Iowa City.
7. Grippen, V.J. (1932). *An analytical study of the content of children's drawings*. Unpublished master's thesis, The State University of Iowa, Iowa City.
8. Dow, M.L. (1932). *An observational study in a playground situation of differences in artistic personality at the child level*. Unpublished master's thesis. The State University of Iowa, Iowa City.
9. Tiebout, C. (1933). *The psychophysical functions differentiating artistically superior from artistically inferior children*. Unpublished doctoral dissertation, The State University of Iowa, Iowa City.
10. Dryce, T. (1963, May 19). Letter to N.C. Meier.
11. Armitage, M. (1963, May 19). Quoted in T. Dryce letter to N.C. Meier.
12. Brown, G.E. (1935, February 7). Letter to N.C. Meier.
13. Meier, N.C. (1962, April 9). Letter to Ellen Moberg.
14. Benton, T.H. (1963, April 13). Letter to N.C. Meier.
15. Meier, N.C. (1952, January 11). Letter to Graflex, Inc.
16. Pearson, R.M. (1939, April 8). Letter to N.C. Meier.

CHAPTER 6

Questioning Art Testing: A Case Study of Norman C. Meier

Marilyn Zurmuehlen

It was in a graduate seminar with Dr. Kenneth Beittel at Penn State that I first learned about the Meier Art Tests. I was introduced to them in an historical context, as curiosities from another time, long discredited in their intention to test artistic ability or aptitude. Prior to this exposure, my sole experience of art testing was a scant notice of ads I encountered each month in my adolescent reading of *Seventeen* magazine. These always featured the same distinctively schematic, black and white, line drawing of a girl's head, in profile, above the words, "Draw me." Underneath this appeal was an explanation that your drawing would be used to determine whether or not you were eligible to enroll in an art instruction course. One afternoon during my ninth grade art class, someone asked the art teacher about these ads. A man who typically spoke very little, he replied cryptically, "Never send one of those in." While I had not been tempted to do so, his response bestowed a certain mystery on their banality and this mystery may account for why they have been preserved in my memory. Even in junior high school, I was puzzled about how there might be any relationship between accurately copying those curiously unsatisfying heads and the world of art I was beginning to know in art classes and art museums.

In contrast, my first encounter with formal testing is a source still of pleasurable recollections. For several days, my fifth grade class was caught up in what I only much later understood as one of the rituals of schooling in the United States—taking a battery of achievement tests. These were presented in a non-threatening manner by the teacher and without emphasis on their instrumental nature. Viewing them as something to do, rather than as a disclosure (and certainly not as an assessment), I found the experience to be quite simply and vividly fun. The questions were intrinsically interesting, involving considerations of analogies, both visual and verbal. You were doing something all of the time rather than waiting, a condition which is paramount in most classrooms. In reflection, I realize that much of these tests' appeal was because they provided a kind of Kierkegaardian rotation from the usual routines of school, albeit they were not self-selected. Later, I learned that these tests had *results*, and, indeed, that those results were what adults considered important about them, their purpose; thus, my introduction to the symbolic nature of testing. Tests stood for something apart from the challenge and gratification of solving problems and what they stood for appeared to be a source of pride and excitement to adults, coupled with a puzzling hint of embarrassment. In short, the manner in which adults talked about high test scores was very much like the way in which they communicated about sex and money. The foregoing bits of personal history are not evoked by nostalgia in remembering Penn State, nor are they the occasion for some sort of cathartic confessional, and they certainly are not a means of expanding what must be a brief chapter. Rather, my intention is to acknowledge the validity of Thompson's claim that "Our schemes of history tell us more about ourselves than they do of the past" (1971, p. 196). If we believe that all biography is really autobiography then some context, however small its dimensions, is a necessary grounding for understanding of not only my interpretations, but also what aspects of Meier's relationships I have chosen for attention.

When I came to The University of Iowa to teach ceramics and to head the art education program, I vaguely recalled that Norman Meier had worked there, and in the card catalog of the Education/Psychology Library, I began to come across quite a few theses he had directed. It was not a surprise when Gil Clark's letter arrived in December of 1982 asking if I knew whether any of Meier's papers were available at Iowa. In one of those bursts of collegiality with which we respond to such requests, and perhaps as a relief from the everydayness of end-of-the-semester office chores, I escaped to the Special Collections Department of the library that same afternoon. There a cart of materials, already located by the librarian, was wheeled out for my inspection. It held 13 archival boxes of papers, photographs, and slides. Among these I noted a mimeographed paper, "Art for Every Child," Meier's lectures at the Sorbonne, papers about arrangements for Lowenfeld to lecture during the APA meeting at The University of Iowa in 1950, and a letter of inquiry about Meier's tests from John Herron School of Art as recently as 1963. I was sufficiently intrigued to explore the contents for more than an hour, although my original intention was merely to list and report some indication of the quantity available. Even in this first rather cursory examination Norman Meier's relationships with artists appeared as quite paradoxical. In the years that have elapsed since, interviews with artists who were students in Meier's Psychology of Art class support the frequently negative opinions expressed by other artists in their correspondence with Meier about his conceptions of art and testing.

To summarize, briefly, Meier's research about adult artists grew out of his studies of special art abilities in children. By 1935, Meier was seeking artists to take the Otis Tests of Mental Ability. In letters, he introduced his study to artists as sponsored by the Carnegie Foundation for the Advancement of Teaching and wrote that "One phase of this research program concerns the kinds of intelligence which the artist, handling problems typical of his profession, employs." He added that "We are sincerely interested in learning what we can about the artist's mind with a view toward the advancement of art education." He further assured them that their test results would be kept confidential. This request seems to have antagonized a number of artists, although some were eager to be informed of their test scores. An example of those who were quite direct in disparaging intelligence tests is the response of Margaret Zorach (1935) from New York City, who wrote also for her husband:

> I am sorry neither of us found the time nor inclination to answer the Otis tests you sent us. Once we did answer a few but they are too numerous and if you don't mind my saying so—too stupid. It's bad enough to always have these things inflicted on our children without including their parents. I'm sorry, I can't see the importance to anyone concerned of such data or the passion for collecting it.

On the other hand, John Sloan (1935), also from New York, wrote more benignly:

> I am glad to have you herewith my questionnaire tests. I am a queer stick, I suppose—but far from being provoked by your request I was pleased. I enjoyed doing it and am ashamed to confess that it took me 5 minutes over the allotted half-hour. I would be pleased to receive the results of the test.

In a postscript, Sloan added, "I believe if I had tackled it earlier in my day I would have done better. I attacked the thing after 9 hours painting."

It was the premise and the method of operationalizing the premise of the Aesthetic Perception Test, however, that seemed to elicit most consternation among artists. In letters to persuade them to help validate this test, Meier explained:

> [It] has fifty works of art re-drawn in four versions. It was expected that one would be better than the others; one definitely poorer and the other two would fall in between. We need to have the judgment of a number of established artists before we can know what is the proper order: best, next best, third best, and poorest.

Artists were likely to regard these assumptions as evidence of Meier's naivete about art. Byron Burford, Head of Painting at The University of Iowa, was a student in the Psychology of Art course taught by Meier during the late 1940s. In an interview, he recalled being "discomforted" by the class because his perception was that Meier "knew the answers for everything." Art students took the course with expectations of studying sources and reasons for making art, "what things stem from the unconscious," Burford remembered. Instead, Meier talked about "moving things around in the painting." Kay Burford, a painter who also was a student in Meier's Psychology of Art course, described as typical a session in which Meier put a reproduction of a painting before the class, "and then recomposed the painting to make it look better" (see Figure 7). She added, "He'd say, 'Now I think that should be moved over a little bit or it should come forward.'" Both Burfords thought a dogmatic attitude was evident, as well, in Meier's tests of aesthetic judgment. Kay observed, "You know the answers he wants," and, "They would be the less interesting answers in most cases, I mean the ones artists would be less likely to pick." Byron expressed a gulf between Meier's approach to art and that of many artists Meier attempted to study when he reflected, "You know the artists always thought they had the opportunity to have 2 and 2 make 5, to make it work. He wanted 2 and 2 to make 4." Kay affirmed that Meier "certainly didn't like the unexpected," adding, "He was not a bit interested in anything unexpected."

A contemporary sculptor articulated a stance taken by many artists when he explained in an interview that "Science was something I found absolutely not gratifying. It was like the height of meticulous bookkeeping combined with recipe following" (Cummings, 1979, p. 177). Although this sculptor was not referring to Meier's work, his analogy illuminates aspects of Meier's measurement attempts that many artists felt lacked authenticity.

It seems from their responses to Meier's studies of composition that artists felt his manipulations of objects were similar to recipe following and that he was insensitive to the dynamic nature of an evolving art work. Meier appears to have arrived at a more empathetic understanding of those people who chose to spend their lives making art in his later questions

Figure 7. Norman C. Meier lecturing about a painting

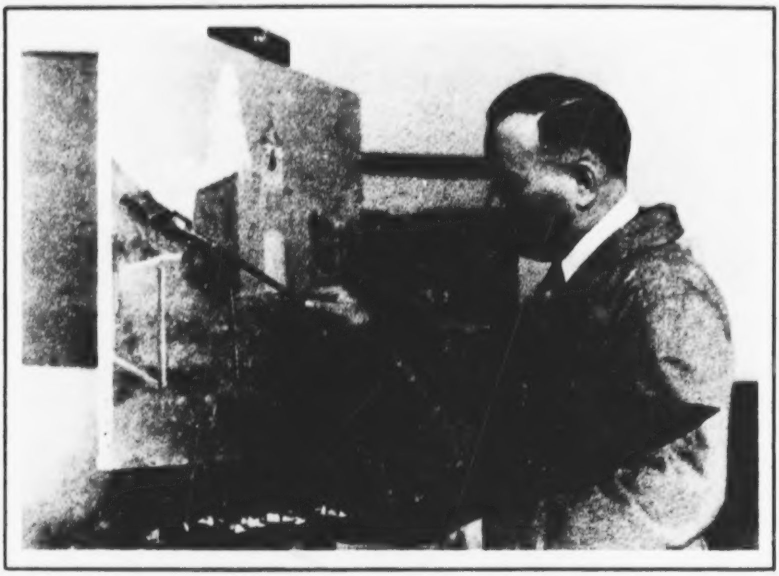


Figure 8. Norman C. Meier as painter

addressed to individual artists about their methods of working. While Meier encountered the difficulties of an outsider who studies another group of people, he endeavored to establish his authority by attempts at painting and showing the results. A letter, written in 1962 to the director of the V.A. hospital in Fort Meade, South Dakota, is one example of several in which Meier mentioned that "I have had paintings accepted for exhibition in Omaha, Chicago, and other places."

Among his papers in The University of Iowa Archives is a black and white photograph taken from a middle distance that shows the upper torso and head of a man in profile. He is wearing what appears to be a lab coat, a white shirt and tie are barely revealed at his neck. In his right hand he holds a board that I take to be a palette, because from his left hand a long brush is extended to touch the surface of a painting, mounted on an easel. The painting is turned in a three-quarter view so as to be clearly visible to the camera lens. The man is Norman C. Meier, the photograph obviously was posed. There is no indication of the photo's purpose. Did he, perhaps, consider it documentation of an identity to which he aspired? (See Figure 8).

In interviews and correspondence we have established with former students who were Meier's graduate assistants from 1929 to 1939, all of these assistants connected his interests in art with his research in art talent. Eileen J. Williams wrote, "He clearly much enjoyed his contacts with artists during his work in the Aesthetic Judgment Test. I came to feel that he would have loved to be an artist, or at least to spend his life in some career connected with the art world." Although this group of former assistants obviously felt many strong loyalties to Meier, even they acknowledged that, if such was his aspiration, he was not successful in this respect. Carolyn Tiebout, who completed a PhD in the Psychology of Art in 1933, told us in an interview: "And Meier, of course, was not an artist. Did Kay tell about his taking lessons and going out to Taos to paint? I don't know if he actually took lessons from somebody but he went to Taos to get the feel of painting and he did some painting which I guess some of the others didn't think was that good."

Aulus Saunders was an art teacher in Webster Grove, Missouri, when in 1932, Norman Meier offered him a position as a research associate. He wrote to us that Meier "had a continuing interest in art, and would have aspired to be a painter except that he knew that he was to some extent color-blind. This condition may have led him, a man of intelligence and analysis, into a search for the bases and conditions surrounding art ability and behavior." William McCloy entered the MA program in the Psychology of Art after completing a BA in Graphic and Plastic Arts and an MFA in Painting at The University of Iowa, interrupted by a year of study at Yale. Later he earned a PhD in Art History. His warm recollections of Meier are apparent in these comments: "I was not seriously interested in Psychology—and I was very young—I was often aggressive with him and his (Dr. Meier's) work, but he continued to treat me fairly and without rancor." However, McCloy wrote critically of Meier's artistic pursuits: "I thought him naive about art (and still do) and was convinced that the research in this field had little relevance."

Recollections by former students of their graduate study with Meier suggest that he must have found much more gratification in research and teaching than assessments indicate for his artistic aspirations. Margurite Birch Clair described the students that Meier assembled for his research projects. "About half the people in the group, I among them, had an art background. The others were psychology majors or undergraduates. Naturally, we approached problems from different points of view, and often new ideas were born there." Kay Snow Whorley, who received her MA in Psychology in 1932, remembered, "We all worked together a lot and talked together. We read the same sources." Meg Birch Tobert also recalled a supportive atmosphere: "Our Psychology of Art seminars with Norman Meier were very open—no holds barred. Everyone free with criticism of everyone else but in a completely unhostile way. We truly loved each other."

One of the satisfactions of historical research is discovering people and events whose existence we had not even suspected and sedimenting our experience of their recollections so that they are transformed with us into our collective futures. Our correspondence with Eileen Jackson Williams was such an occasion. She sent us a copy of a paper entitled, "A Psychology Laboratory in the Twenties: A Memoir." Vivid in its descriptive passages, enlivened by insights into people and their ideas, it is an extraordinary piece of historical writing. That she prepared and delivered it in 1978 to a "scientific interest club" is a testimony to the modesty of genuine research and yet another witness to Annie Dillard's (1982) observation that:

> Thoughts count. A completed novel in a trunk in the attic is an order added to the sum of the universe's order. It remakes its share of undoing. It counteracts the decaying of systems, the breakdown of stars and cultures and molecules, the fraying of forms. (p. 174)

In a handwritten letter from Bethesda, Maryland, Eileen Williams introduced her recollections of working with Meier by stating, "My only importance is that I was there rather early. I was very young." She recalled:

> The Seashore tests of musical talent had aroused general interest. Applying the same techniques to other art forms might naturally seem a promising avenue for new research. At any rate, a grant from the Laura Spelman Rockefeller Fund at the Child Welfare Research Station was forthcoming to Dr. Meier. The atmosphere was one of happy excitement. I think he must have been looking forward to working with young artists. Although we had always been on good terms he must not have been pleased with Dean Seashore's decision that I would furnish the needed knowledge of scientific standards for the tests. What the Dean decided was seldom questioned, and I *had* made a really high score on the aesthetic judgment test, so what could poor Dr. Meier say?
>
> I was not unsympathetic with him, a proud man who must have disliked having others make decisions that affected him without even consulting him. I was also concerned about the problems I would face. I was to work on the perception of color harmony, a fascinating but particularly complex and subtle aspect. How could it be reduced to a test situation with right and wrong answers and coefficients of reliability?

She concluded her account with a speculation that may be a gentle recommendation.

> I sometimes wondered if the project ever managed to get away from the hard-boiled test concept. For instance, getting suggestions from persons who were used to and good at appraising the possibilities of youngsters in the field might yield a *somewhat* standardized approach to such appraisals to aid intuition. It wouldn't be easy would it?

Finally, we learned about Eleanor Pownall, who lives in Iowa City, only three blocks away from the Art Building of The University of Iowa. Carolyn Melampy Tiebout asked us, "Did you know that one of the subjects of the study (Meier's research into artistic aptitudes of children) later went on to write and illustrate children's books? I think her name was Eleanor Pownall. This is her drawing here." She pointed to one of the drawings by children that are reproduced in the report about aesthetic judgment. Interviewed at home, surrounded by her art work, Eleanor Pownall recalled that "there were always testings going on" when she was an elementary student at University School. She remembered that the physical things were the least fun. "You know, they'd measure bones and flesh and hold calipers on cold mornings," she explained. When questioned specifically about Meier's study, she reflected, "Well it was fun and also it took you away from the rest of the class doing dull things, so that was fun. And it was kind of a nice little group, though I don't remember who all was in it. I think Norman Meier's son was in it." Meier's son Mark was in the group.

Alert readers will recognize that we have come full circle in this chapter from my recollections of childhood testing to a subject's recalling impressions of such testing for me, and that we appear to share a certain intersubjectivity: tests were fun, in no small part because of their novelty in the context of schooling routines. I also suggest that children experience testing as yet another thing that happens in the world, something to be done. Innocent of the knowledge of tests' symbolic import, children view them as ends rather than means. Adult artists who questioned, and even rejected, Meier's conceptions of testing for art ability were acutely aware of the symbolic portent of tests. Their concerns, and at times their indignation, were grounded in doubts: Is it art aptitude and ability that are revealed in the results? Are such tests the most accessible means we have for recognizing these conditions?

In her memoir of the Psychology Department, Eileen Williams concluded:

> As we look back at this far-away time, we find that much of the research was of little significance. Some other studies were indeed fundamental but nothing has ever been built on them. A few others were solid and thorough but dealt with topics that are currently unfashionable. Still, some future researcher may come upon something interesting if he, too, decides to read the minutes of the meeting before the last.

Neither, it appears, did Meier's efforts succeed in convincing artists to regard him as a cohort, but his studies, correspondence, and interviews with artists may have produced an unanticipated, perhaps even unrecognized, accomplishment. Norman Meier seems to have become an unacknowledged participant-observer in the world of art and his understanding of that world was enriched by his direct experience of it.

Author Notes

This research was supported in part by the Graduate College of The University of Iowa.

The assistance of Steve McGuire, doctoral student in Art Education at The University of Iowa, is gratefully acknowledged.

All quotations and sources, unless otherwise indicated, are from the papers of Norman C. Meier, housed in Special Collections at The University of Iowa Archives.

CHAPTER 7

Historical Look at Developing Art Tests: Norman C. Meier and His Students

Marilyn Zurmuehlen

> "In the spring of my sophomore year," wrote Eileen Jackson Williams, "when I first visited the office of Carl Emil Seashore, PhD, Head of the Psychology Department and Dean of the Graduate School, it was on the second floor of the Liberal Arts Building. This was a substantial structure of Bedford limestone. Inside, the tall oak doors had bronze doorknobs with the University seal and there were pink marble counters for the washbowls in the 'Ladies'."

The setting was The University of Iowa and the year must have been 1926. Three years later, during the 1929 to 1930 school year, Eileen Jackson Williams was a research assistant to Norman C. Meier. She wrote a description of these experiences in 1978 as "A Psychology Laboratory in the Twenties: A Memoir" and sent us a copy from her home in Bethesda, Maryland, where she was recovering from two cataract operations. In her letter she told us that "I have vivid visual imagery, and I was certainly 'seeing' people and places while I was writing." Her memories position Dean Seashore in a physical context:

> The inner office was a long narrow room across the front of one of the forward-projecting wings of the building. At the near end the Dean sat at his large rolltop desk. There were no rugs or draperies, but he could look outside under the canopy of the big elms, or if he wished, study the adaptations of American fauna and flora that ornamented the neoclassic portico. He was a slight, almost frail-looking man, with a fringe of white hair and a clipped white mustache. His eyes were an extraordinarily bright blue, and their intense gaze over the half-moon, pince-nez he wore must have helped to inspire the awe in which he was generally held.

Seashore was Norman Meier's mentor for the PhD which Meier earned at The University of Iowa in 1926. Eileen Williams' recollections also situate Dean Seashore in an academic context that gives us some insights into Meier's doctoral study experiences:

> The feeling in the Dean's department was that broad scholarship was needed as a background for research. Very few years had passed since philosophy and psychology had been made two separate departments at the University, but the philosophers there and elsewhere had pretty much washed their

> hands of the whole thing. A graduate student still took philosophy courses like aesthetics, but by the time he received his doctorate he had also had mathematical statistics and courses related to his research in the Physics Department and the Medical College.

Meier's interest in art testing undoubtedly had roots in his mentor's long and rewarding involvement with music testing. Williams described the physical evidence of the Dean's research interest:

> In the glass-fronted cabinet in the outer office was a display of instruments dominated by several flat boxes of tuning forks in velvet-lined cavities. These, I was told, were the actual instruments used in the construction of the Dean's major work, the Seashore Measures of Musical Talent. Commonly called the "Seashore Tests," they measured really only some of the perceptual discriminations, as of pitch and loudness, that are necessary for musical performance. Using the method of paired comparison, each test required a series of judgments increasing in difficulty. With enormous labor, considering the technology of the time, these tests had been transferred to phonograph records. They could thus be administered to groups as pen-and-pencil tests. Compiled in 1919, they had been widely used in public schools and at the Eastman School of Music. Although these tests barely scratched the surface of the complex phenomenon of real big-time musical talent, they did deal with basics. They undoubtedly spared a lot of little boys a lot of misery because their mothers, who thought the violin was "such a lovely instrument," could not quarrel with the scientific fact that their sons were only in the 50th percentile in pitch discrimination.

Though such an outcome scarcely could have been Seashore's intention, his conception of testing musical aptitude shaped Meier's thinking about testing for special ability in art.

From 1929 to 1939, Meier, with support of a succession of grants from the Spelman Foundation and the Carnegie Corporation, directed a series of studies about testing for aptitude and ability in art. We have contacted 17 graduate students who assisted Meier in this research project. All but one of these completed theses or dissertations whose topics were segments of the project. The exception is Eileen Jackson Williams. In September, 1930, her husband joined the staff and, as she wrote to us, "That meant, in those depression days, that I could not have a paid position at the University." The particular content for a thesis or dissertation study apparently was conceived by Meier in relationship to his encompassing project. When asked in a 1984 interview at her Oklahoma City home, Katherine Whorley told us how her topic was selected: "This particular study was Meier's study all the way. We did what he told us to. I don't think we put anything creative into it." She added that, "We met in seminars sometimes and talked things over. Of course, it was his baby always, and he always had ideas. He would ask us our ideas and if they didn't go against the grain too much he would consider them. I can't say I can take credit." Eileen Jackson Williams, too, recalled the graduate seminars, "that striking example of peer review." She reflected, "Listeners to the thesis projects of others were torn between the desire to be thought searching and well-informed critics, and the knowledge that their own turn was coming."

Meier brought together graduate assistants who formed his research project through various means and from a diversity of backgrounds. "Well, the honest truth is that I had taken a Master's at Louisiana State and I wanted to go on in psychology," Carolyn Tiebout Melampy told us:

> I worked while I was getting my Master's at a newspaper office; I was the Woman's Page Editor. I happened to know the editor or the publisher so I got this job when I graduated and I managed to save enough money to go away to school. I picked The University of Iowa because the major professor at Louisiana State University knew Seashore and he suggested Iowa. I found that there were quite a number of scholarships open there and Iowa was less expensive than other schools and I didn't have any money. I gambled on getting a scholarship and went to Iowa. I was in Dr. Meier's Social Psychology (class) and I enjoyed that thoroughly; he was very good. He was looking for people to put on scholarship and asked me if I was interested. I jumped at the chance to get it. It was in art and I was not the least bit artistic, but I was interested in the testing side.

After receiving her PhD in 1933 with a major in the Psychology of Art and a minor in Child Psychology, she went to Western Reserve University to work with Thomas Munro and later taught in the Psychology Department at Louisiana State University.

Aulus Saunders, Professor Emeritus at SUNY Oswego, completed his PhD in Education in 1934. He wrote that:

> [Meier's Art Judgment Test] came to my attention when I was a young art teacher in Webster Grove, Missouri, and I used it with my junior high school students as an introductory part of a Master's degree (Washington University) study I was attempting in 1928 to 1930 in the area of art ability in youngsters, devising my own art ability test. This produced a thesis that evidently came later to Dr. Meier's attention, for he journeyed to St. Louis county in the spring of 1932 to interview me for a position on his research team. I accepted his offer of a research associate position at Iowa and, together with my wife, arrived at Iowa City in June, 1932.

Gilbert Brighouse completed a PhD in the Psychology of Art in 1933 after studying at the University of Chicago and doing his undergraduate degree in England. He became a faculty member at the University of Illinois. Margurite Birch Clair arrived from Minneapolis. When she graduated in 1937 with an MA in the Psychology of Art and a minor in Graphic and Plastic Arts, she returned to teach at the University of Minnesota. After receiving a BA from the University of North Dakota in 1913, Hildegard Fried Dreps studied ceramics at the New York State University and then came to Iowa in 1929 to complete her MA in the Psychology of Art with a minor in Art History. Born in Colorado Springs, Colorado, Constance Jasper arrived at Iowa following undergraduate work at the University of Oregon. After she obtained her MA in the Psychology of Art in 1931, she and her husband moved to Montreal where he taught Neuro-Science. Parmeley Clark Daniels, Eileen Jackson Williams, William McCloy, Luella Raab Mundell, Mildred Dow Voss, and Katherine Whorley all had Iowa backgrounds. William McCloy's academic studies embodied the diverse interests that characterized Meier's group of graduate assistants. He first received a BA in Graphic and Plastic Arts from The University of Iowa, then studied at Yale for a year, following that he returned to Iowa for an MFA in Painting and and MA in Psychology. He completed a PhD in Art History before leaving to teach in the Psychology Department at the University of Wisconsin.

The Psychology Department at Iowa offered two areas of specialization that appear to be unique among university programs at that time; they were Psychology of Music and Psychology of Art. Clearly, these were an outgrowth of Carl Seashore's and Norman Meier's interests. In a Report of Progress dated September 15, 1934, Meier maintained that "In the Psychology of Art unit at Iowa there has been a successful merging of competent investigators representing art, art education, child psychology and art-psychology, under the guidance of a director familiar with problems of both art and psychology." Certainly this statement is accurate insofar as it reflected the various major fields of study from which his research assistants were drawn. It was Meier who obtained the financial support that made it possible for the program to fund graduate students from several areas. The Laura Spelman Rockefeller Fund financed a joint project with the Iowa Child Welfare Station that encouraged participation by majors in the Psychology of Art classes as well as assistants in the research project directed by Meier. It is possible that this connection may account for the high proportion of women research assistants during the project; there were 13 women and four men. Carolyn Tiebout suggested, "I think maybe he (Meier) felt that women were more compatible with young children. . . . There were more women in Child Welfare, naturally." This situation may have caused some difficulty for Professor Meier with Dean Seashore. Dr. Tiebout recounted an incident to us that provoked her to speculate on the possibility of such tension. "Dean Seashore was not too keen on women getting advanced degrees. My father came up to visit when I finished. He went in to talk to Dean Seashore and Dean Seashore was still pretty much against women getting a PhD. Seashore told my father that it sort of riled him. My father, of course, was interested in having his daughters get PhDs. But, Seashore was of the old school," she continued, "And, of course, since Meier had women students and assistants, Seashore didn't go along with that at all."

Students' recollections of what other faculty members thought about Meier's research reveal that there also may have been differences between Meier and his colleagues concerning the value of his research. Such differences are significant in a university situation, and perhaps especially in Psychology at that time, because the research a faculty member does often determines how he or she is recognized by other faculty. Carolyn Tiebout related, "Now Stoddard was the kind to develop a test where you draw a straight line to see whether it wiggles. Well, that's simple, compared to studying things like art. Stoddard was statistically minded and he didn't think Meier put enough emphasis on that."

These accounts emphasize personal aspects that may have played a part in dispersing the group research efforts recalled by students from this decade; however, more fundamental forces also were noted. Eileen Jackson Williams echoed Carolyn Tiebout's insight; she wrote, "Researchers had already begun to realize that many problems were much more complex than they had seemed at first."

Clearly, the climate in which mental measurement flourished at that time was conducive to the notion of testing for art aptitude and there are obvious parallels between not only the form but, more importantly, the intent of IQ tests and the art tests conceived by Meier. Fallows (1985) pointed out that "Forging a link between intelligence and occupation was explicitly the goal of early psychometricians" (p. 56) and he argued that IQ tests contributed to an American meritocracy by providing some apparent basis for channeling people into appropriate levels of education and suitable jobs. As early as 1927, Meier, in a paper entitled, "Can Art Talent Be Discovered by Test Devices," advanced reasons for art testing that are quite compatible with the meritocracy values of IQ testing. In addressing those attending an Annual Meeting of the Western Arts Association, he stated that "As teachers and developers of future artists, you wish to know what members of your classes will benefit most from instruction; while society would reduce the loss from unused talent on the one hand, and the waste of misdirected talent on the other" (p. 74). This sounds very much like Fallows' (1985) contention that meritocracy depends on a widespread "belief that an individual's IQ placed firm limits on how extensively he could be educated—and, because of the emerging link between education and work, on the jobs to which he could aspire" (p. 59). In an attempt to forestall arguments he may have heard before or perhaps recognized for himself, Meier (1927) suggested that some might view his tests as gratuitous because superiority in art would be evident in the classroom. He maintained that "The test device, however, serves an additional function. It is the truant officer that goes out and corrals those who are not in the art classroom—but should be! More than that, it stops people everywhere and asks the question: How much talent do you have?" (p. 74). While the metaphor may not be appealing, the notion of adding talented students to art classrooms undoubtedly was intended to be. When Meier went on to advocate his test as "a rough measure of an individual's limit of progress or his likelihood of success or failure," and add, "It should answer the question for him: to what degree is he artistically educable" (p. 78), he was arguing for an artistic meritocracy that would operate in the way widely believed at the time that IQ tests would predict school achievement and eventually career success.

While IQ tests appear to have fallen into some disrepute, Hacker (1986) recently wrote that Scholastic Aptitude Test scores "have become the closest thing we have to a national IQ" (p. 36). His observation supports the argument that a culture ostensibly based on merit continues to hold broad acceptance in the United States. But in a review of David Owen's *None of the Above*, along with several other books related to this topic, Hacker (1986) showed that SAT scores are vulnerable to many of the indictments brought against IQ scores. A multiple-choice format, he contended, "discriminates in favor of those who can adapt to the rendering of knowledge the tests represent" (p. 37). Many, and some would say better, students tend to reject the premise of right-wrong answers on which they are based. It is argued by some that SAT scores reliably predict neither undergraduate performance nor later accomplishments. Perhaps the most telling piece of information is that "Bowdoin College stopped requiring the test after discovering that many of its best students turned out to have had below-average scores. (Johns Hopkins Medical School and the Harvard Business School recently came to the same conclusion.)" (Hacker, 1986, p. 36).

Despite such evidence of shortcomings, both IQ tests and SAT scores have been extensively collected and used in this country. Meier made his efforts to establish testing for art aptitude at a time when prevailing thinking accepted the concept of aptitude and there was considerable enthusiasm about testing as a means for identifying such potential. Furthermore, he advocated development and dissemination of art aptitude testing on the same appeals, predicting academic and job success, that were so effective for the mental measurement movement. It seems likely that both these conditions contributed to Meier's securing Spelman and Carnegie funding for his investigations; his associations with Seashore and with The University of Iowa, both acknowledged for test development, undoubtedly were additional assets.

Why, then, after the excitement of the 1930s decade of research and the strenuous efforts by Meier to advance the notion of art testing, did the movement never achieve anything approaching the acceptance of mental testing? Local conditions, I have suggested, may be a part of the reason. Some art educators will answer that this is yet another instance demonstrating that the role of art in society is relatively unimportant. The credentialing phenomenon, as advanced by Fallows (1985), suggests a more far reaching explanation. In what he characterized as "the general social chaos of the late nineteenth century" (p. 52), traditional notions of social order and sources of security came to be questioned by people living in the United States. Enhancing the prestige of their occupations was seen by many dislocated craftspeople, semi-professionals, and professionals as a means of achieving security. People from specific occupations organized themselves into groups that attempted to raise entry standards and status associated with their particular jobs. The advent of IQ tests provided such groups with a means for selecting, on the appearance of merit, those who would be admitted to the kind of schooling that would credential them for later status occupations. Hence, the popular acceptance of IQ tests or mental measurement. Artists, however, did not band together into such groups to exclude others who sought to become artists, unless jurying into exhibitions or acceptance into art academies are viewed as manifestations of these attempts. Even if such establishment practices in the art world may be construed as credentialing, artists were quite confident in their own judgments without recourse to some sort of external testing measures. Furthermore, during most of this century, curators, critics, collectors, and, sometimes other artists, have attached considerable value to discovering new directions in art. When such a value system prevails, the kind of credentialing based on testing devices is not rewarding for those who intend to become artists. Indeed, any credentialing that exists for monetary success in the art world resides in the power of critics, collectors, and curators to establish a market for work by certain artists.

An historical view of Norman Meier's efforts, along with his students, to develop and gain acceptance for art aptitude testing suggests that he was acutely conscious of the value placed on testing in our society. His early projects may never have reached the fruition he envisioned because he failed to understand that success in the art world is not constituted by the kind of credentialing established by some other occupational groups. In Fallows' terminology, artists are entrepreneurs rather than professionals.

Author Notes

This research was supported in part by the Graduate College of The University of Iowa.

The assistance of Steve McGuire, doctoral student in Art Education, in locating and interviewing former graduate assistants of Norman C. Meier, is gratefully acknowledged.

All quotations and sources, unless otherwise indicated, are from the papers of Norman C. Meier, housed in Special Collections at The University of Iowa Archives.

CHAPTER 8

A Psychologist Studies Artists

Marilyn Zurmuehlen

Meier's research about adult artists grew out of his studies of special art abilities in children. One noticeable difference between the children's and adults' responses was that adult artists often felt free to express their opinions about Meier's investigations.

In a progress report during 1935 to 1936, about "Genetic Studies in Artistic Capacity and Art Education," Meier briefly mentioned that "Creative imagination has been investigated in children and in adults by means of a special apparatus. In studying active imagination the subjects create their own composition in form and color. In passive imagination they react to creations previously made by the investigator (a research artist)." Perhaps he refers to himself. At any rate, he described the apparatus in more detail:

> [It is] capable of reproducing in miniature practically any setting or condition in nature, still-life or figure group. It was designed and constructed, consisting essentially of a miniature stage with translucent back, six batteries of red, yellow, and blue lights controlled by five Variac auto-transformers. Additional variable light and color sources include four spot-lights, and one semi-flood light. A Spencer 1000-watt delineascope was used in the rear to project backgrounds, sky or any desired natural or special setting. The procedure involves the use of base-forms modeled in plasticine clay (figures, basic landscape, etc.). The form on the stage is then fused with background by variable illumination into compositions of which there are an infinite number and variety. Two procedures are available: creative work by subject operating controls, and reaction to previously constructed compositions reproduced by Leica photography or direct color process.

The machine can be seen in a photograph for a newspaper article preserved in Meier's files (see Figure 9). Under the heading, "Who Is an Artist," the story was published in 1939. For some readers it may recall Dr. Thomas More's Qualitative Quantitative Ontological Lapsometer invented by the protagonist of Walker Percy's novel, *Love in the Ruins* (1971). By listening to tiny areas of electrical activity in the brain, More dreamed that he could measure and treat the "deep perturbations of the soul" (p. 28). For others it may seem that Meier had anticipated some of the attractions of video arcades. Apart from its rather dubious value as a means for deciding who was an artist, it is easy to imagine that devising and constructing the apparatus was great fun for Meier and his students. Its appeal for children

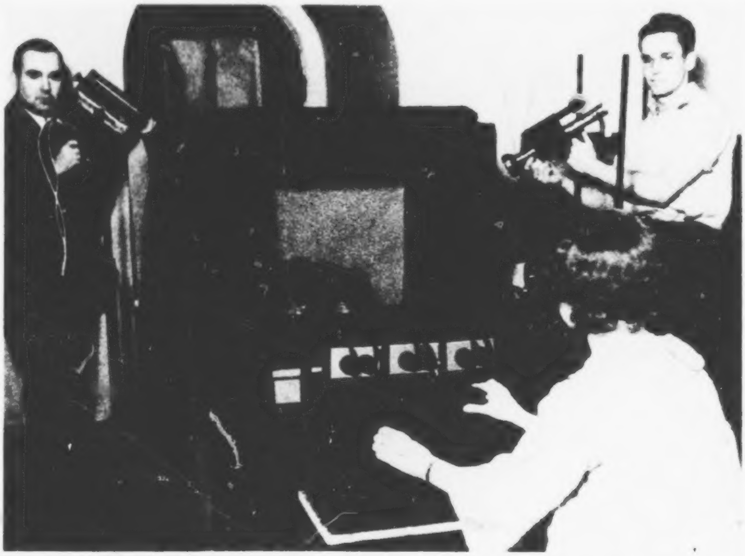


Figure 9. Subject manipulating composition apparatus (Meier standing at left)

who were tested also seems evident, especially when they were invited to operate the controls to create their own compositions.

Although in contrast, Meier's studies of adult artists often focused on their verbalizations, in 1932 he wrote letters to a number of artists, explaining:

> In connection with our research in the early stage of development of artistic capacity, it is planned to get some sketches made by different classes of adults, some artists, some not artists, to see if the same differences in ability separate the child artist from the child nonartist.

After providing this brief background he requested:

> What we would like to get from you and a number of other well-known artists is a collection of about twenty-five sketches made in pencil, crayon, water-color or anything desired. We would like to have the sketches represent something which the artist might at that time, or had in some past time, contemplated making for the purpose of developing into a finished painting. It should represent the usual kind of picture painted by the artist and sketched out in about the usual manner and we would like to have included in the twenty-five a representative collection of the individual's work and would expect to find some good, some poor, and some average. We do not want twenty-five extreme efforts of anyone nor twenty-five carelessly done

> sketches. What we want is a representative sampling of the type of work the artist does.

He offered some reassurances:

> We will not treat this in any way so that the artist's identity is known; no comparison will be made among the artists doing this. All we want is to see what differences exist between the average type of high-grade artist's work and an average type of work done by nonartists as compared, in turn, with the highgrade artistic child, and nonartistic child.

Meier offered to send 9″ × 12″ sketch sheets or suggested that the artists use their own materials if they wished to work larger and stated that "We are prepared to pay an honorarium of $25.00." This was intended to compensate for what Meier estimated would require about "five working hours" from each artist. Typical examples, selected from sketches sent by Oscar Beringhaus of Taos, New Mexico, are shown in Figure 10.

Later in 1932, Meier wrote to a number of artists asking them:

> At what age did your interest in art first become manifest and whether or not you painted or drew anything of interest at the ages of five, six, or seven. I would also like to know if you would be good enough to take the time to write me about what you regard in your own case was the most important and significant factors in the artist's equipment that make for success in art.

Perhaps the tersest response was from E.W. Redfield of New Hope, Pennsylvania. He wrote, "Sorry that I cannot join you in your efforts to discover the whatness of what!" and signed the note, "Sympathetically." F. Tenney Johnson, of Alhambra, California, however, was more expansive:

> It might interest you to know that I was born in a little two-room house on the open prairie twenty-five miles east of Council Bluffs, Iowa, was never at all brilliant in school and at the age of sixteen, while in the second year of high school at Oconomowoc, Wisconsin, I decided to become an artist, and became an apprentice to Mr. F.W. Heinie, an artist who had been in the Franco-Prussian war as a staff-artist and was a panorama painter later on. From that time until the present I have followed this line of endeavor and no doubt you know that I have the distinction of being the foremost painter of Western Life in America.

Pissarro answered Meier's query by writing:

> I believe most children have a natural feeling for art which is killed by education before they are 10 years old. There are but few that survive to have what is left of their artistic gift killed in the art schools and fewer still escape with a little artistic feeling at the end of it all. I am afraid the more intense artistic education becomes the worse it will be for art.

Meier's request seems to have offended a number of those to whom he appealed for help. A letter from Henry R. Poore of Orange, New Jersey, written in 1935, suggests that Meier had complained to him about difficulty

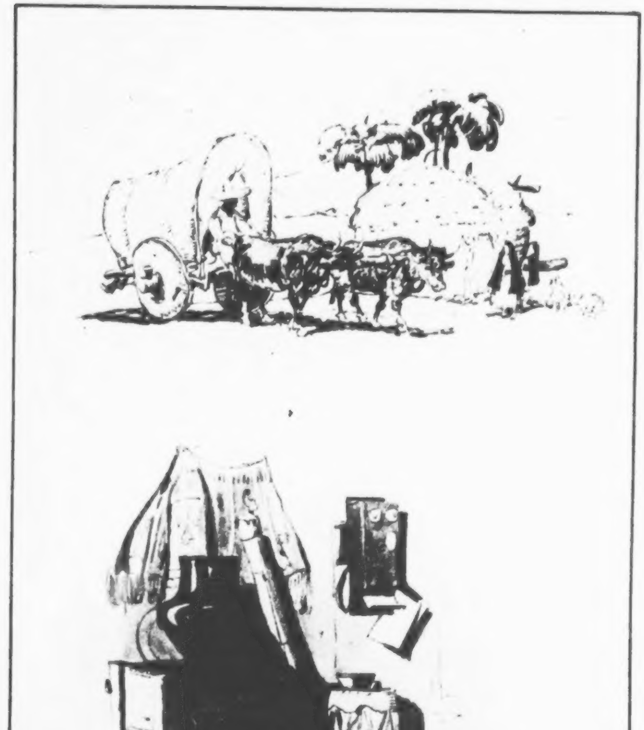


Figure 10. Three sketches by Oscar Beringhaus of Taos, New Mexico

in securing cooperation from artists. Poore replied: "I am sorry you are having trouble in getting a rise out of the artists and may suggest that the test questions involved the implication that they were either in the kindergarten or their dotage."

Possibly collegial considerations played a role in Grant Wood's participation; he was a faculty member in the School of Art and Art History at The University of Iowa. A copy of the Otis Self-Administering Tests of Mental Ability, completed by him in July 1935 is among Meier's papers.

In a letter dated 1935, from New York City, George Elmer Browne reflected: "I got the Otis test paper that you had sent me and filled it out. Probably it is full of mistakes as I did not give it much study. The test is interesting, but I cannot help but think that it has very little to do with the matter of education as applied to art teachers, or to museum directors, or to painters or sculptors."

Although Ivan Albright's letter is not in the files, we may infer from Meier's 1935 reply that it was critical. Meier's answer seems somewhat defensive:

> Thank you very much for your unorthodox responses to some of the items of the Otis Test. We enjoyed them perhaps as much as you did in writing them. We are not, however, interested at the present time in reflections of personality that might be shown in that manner, nor as to whether or not such tests are imperfect instruments. I rather think that if you feel the test is ill-advised and unsatisfactory, perhaps we should send this blank with your comments to the maker of the test, Dr. Arthur Otis at Yonkers, New York. He has been interested in this problem for only about 22 years.

One of the most indignant protests was from Katherine S. Dreier on letterhead from the Hotel Great Northern in New York City, dated February 7, 1935. In part, she wrote:

> I studied your set of questions and cannot find any relations to art or the artists' point of view towards life which makes him such an important factor in the life of the community . . . . The intellectual insolence which these questions appeared to indicate filled me with amazement . . . . I know that the so-called 'Iowa Boys' are all the fashion in the commercial art world of today . . . . In fact they appear to me in paint what Sinclair Lewis is in literature.

The files do not contain a copy of Meier's response, but on February 19, 1935, Dreier replied, "I am sorry if I was rude—but the wording of certain sections of your letter plus the fact that you were financed by the Carnegie Foundation roused my skepticism, for though Mr. Frederick Keppel is a charming gentleman he has no real understanding for art. You need only look at his selection of engravings in his office to become aware of it." She also informed Meier that she had developed "an interesting lecture—Should Art Be a Part of Every-Day Life?" and mentioned that she would be lecturing at Black Mountain College during April.

Meier's efforts to persuade artists to help validate his Aesthetic Perception Test met with considerable reluctance. For this test, 50 works of art were redrawn in four versions and Meier wanted artists to judge them in rank order. In April 1963 he worried, in a letter to Thomas Hart Benton, that "We need the rankings of as many artists as can be inveigled into doing this despite their objections, criticisms, doubts, misgivings, and what have you." Benton was one who cooperated. He was concerned, however, in his letter, also dated April 1963, that "I found myself always up against the same difficulty I mentioned when you showed me the first set of reproductions—that of making qualitative judgments about objects whose qualities are not sufficiently indicated." He continued:

> Further the free and arbitrary arrangements, which characterize so many of your twentieth century selections, are so little damaged by arbitrary changes that, it seems to me, any choice made would be aesthetically as good as another. This might not apply, of course, if you showed differentiations of color and texture or if the point was to guess at the original of the arrangement. The latter would hardly be an aesthetic point, however.

Meier's correspondence and interviews with artists produced more reciprocity than he may have anticipated. He studied the artists, but again and again the artists attempted to educate him by communicating their doubts, concerns, and fears that he was misunderstanding art. There are indications that the psychologist was expanding his methodology and, perhaps, his notions about art. In 1955, Meier was awarded a $1,500 grant from the Johnson Fund to study the creative processes of artists. He reported (1958) that he interviewed artists from New York City, Chicago, Milwaukee, St. Louis, Berkeley-San Francisco, and Seattle about procedures they used in developing their works. While this investigation may be viewed as a continuation of his 1932 analyses of artists' preliminary sketches, in the 1958 summary Meier recognized that "the structure 'grows' fortuitously . . . and proceeds at random but usually is aesthetically acceptable when terminated" (p. 281).

An undated letter to Benjamin Palencia in Madrid indicates the sort of questions Meier asked artists he interviewed about their methods of working. He began by writing that he was very impressed with Mr. Palencia's paintings at the Venice Biennale during the previous October and then listed these questions:

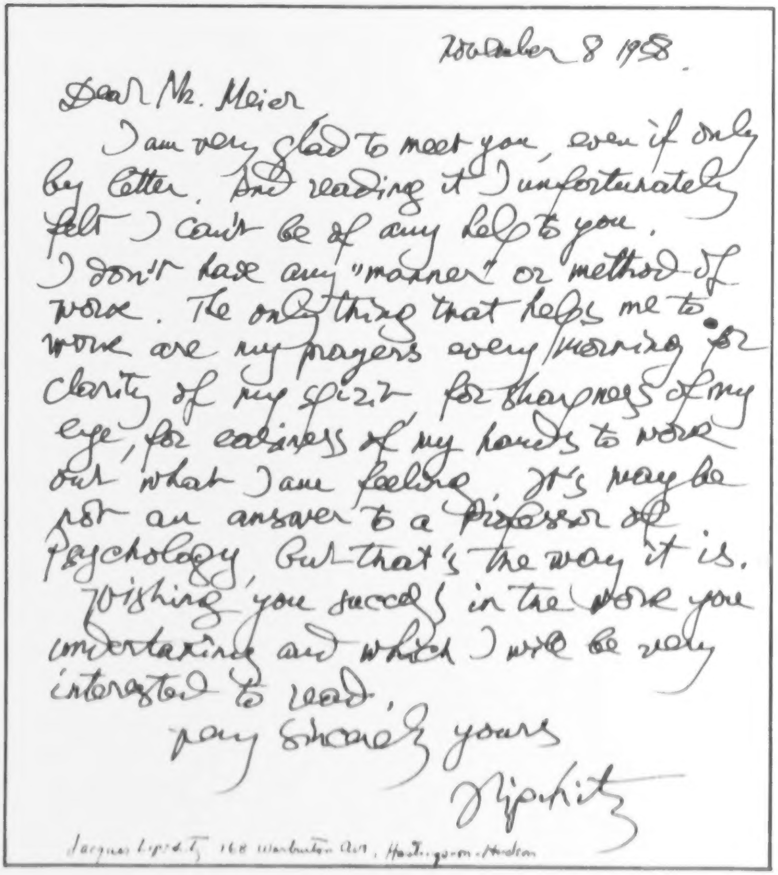
1. Do you compose your painting with the scene before you?
2. Do you finish it up there?
3. Or do you outline it, make color notes, and complete it in the studio?
4. Do you attempt to get the real colors as you see them?
5. Or do you intensify some, subdue others, and vary others in order to get a better composition?
6. By what means do you decide when the picture is just as you want it—finished?

7. Do you try for aesthetic qualities, such as balance, rhythm, harmony, etc., in order to attain unity?

Meier concluded: "Perhaps these questions do not cover the whole matter of how you work. Perhaps you would rather explain it in your own way." This letter also reveals one of the strategies used by Meier in selecting artists to contact. He came across work that he liked and proceeded to write to the artists and request an interview.

Surely, one of Meier's frustrations must have been a handwritten letter from Hans Hoffman, in May 1956, stating that he would not be able to talk with Meier "about creative painting" because he was leaving New York for the summer. A 1958 letter from Jacques Lipshitz (see Figure 11) is more informative, although probably it was no more gratifying to Meier:

Figure 11. Letter to Norman C. Meier from Jacques Lipshitz



November 8 1958.

Dear Mr. Meier

I am very glad to meet you, even if only by letter. And reading it I unfortunately felt I can't be of any help to you. I don't have any "manner" or method of work. The only thing that helps me to work are my prayers every morning for clarity of my spirit for sharpness of my eye, for easiness of my hands to work out what I am feeling. It's may be not an answer to a professor of psychology but that's the way it is.

Wishing you success in the work you undertaking and which I will be very interested to read.

Very sincerely yours

Lipchitz

Jacques Lipchitz 168 Warburton Ave, Hastings-on-Hudson

> I am very glad to meet you, even if only by letter. And reading it I unfortunately felt I can't be of any help to you. I don't have any "manner" or method of work. The only thing that helps me to work are my prayers every morning for clarity of my spirit, for sharpness of my eye, for easiness of my hands to work out what I am feeling. It's maybe not an answer to a Professor of Psychology, but that's the way it is.

It appears to have been a common practice for Meier either not to make an appointment in advance or to write to artists just before he was leaving on a trip to their community. Glenn A. Wessels, Professor of Art at University of California, Berkeley, wrote Meier a 3-page, single-spaced letter about the sources of ideas for his paintings because he had not been present when Meier visited there with the hope of interviewing him. After outlining some of the sources of his work, such as "the sea and water forms seem to be a preferred visual image . . . I have been a swimmer and fisherman all my life. Perhaps this has its influence," Wessel described his work procedure:

> I lock the door on interruptions, place a blank canvas in front of me and wonder what should be painted upon it. From somewhere comes a notion that I should like to use a certain brush, a certain pigment or a certain pen. Perhaps a vague notion of what is coming tells me that the canvas before me is too long or too large and I change it for another. I see the painting in my mind vaguely, like forms in a fog, and slowly try to develop this vague form until it is clear, until it is brought to expression so that it might communicate to others what I feel about it. Sometimes it goes wrong and I lose my way and this canvas will lie around the studio for months, even years. Suddenly one day when looking at it a conviction will come as to what should be done to develop it further. Most often a canvas is around for two or three months. I work on four or five at a time, moving from one to the other as ideas come. When I cannot think of anything to improve it I hurry it off to the framers before I am beset by doubts concerning it that might lead me to destroy it.

The artist concluded:

> I should have liked to talk to you about the aim of your work. At one time it seemed to me that I needed to subject the ideas given me by various art teachers to psychological testing, hence the AB in Psychology! But I soon realized that this was a very long road which would keep me from painting if I followed it to the end. And painting seemed to be more important, so I deserted Tolman and Weaver and took off for Munich and Italy and came back a painter.

Meier answered Professor Wessels in a letter dated July 1963, indicating that Wessels' letter had been received that same month. Meier wrote, "I have read it with unusual interest because artists who are both creative and articulate are a rather small minority." Contents of this letter also indicate that Meier wrote to artists for many years and now was including cartoonists among those he sought to interview:

> It is of course a special interest to me that you have had a background in psychology . . . but I am inclined to think what one does as artist may or may not be much related. I prefer to think of the whole residuum of past experience as a potential source of ideas for themes, and other kind of effect on present work, rather than recourse to terms used by psychoanalysts and others. Certainly Chagall still draws upon his life experience plus a genius for organization for these thematic items into rare color, texture, and form harmonies. Charles Schulz, I learned during a visit with, draws on his boyhood experience and memories, plus keenly observing about every one and every human relation he comes upon in visiting others, for his "Peanuts". . . . As one cannot think of any projected theme save with some recognized or unrecognized past or present experience or background association, it must be that the influence of past masters, contemporaries, students, conversations all may at some time or in some ways affect the creative process.

It was characteristic of Meier's relationships with artists that, when he was attracted to the work of two Indian artists in the October 1955 issue of *National Geographic*, he attempted to locate them for his interviews about the creative process of artists. By October 1962, he traced Calvin Larvie, through the Philbrook Art Center in Tulsa, to the VA hospital in Fort Meade, South Dakota. Meier wrote to the artist:

> Mrs. Snodgrass gave me your address and also informed me that you had an extended service in the Army which prevented your painting much since you did "People of the Sky". . . . She also said you are now hoping to resume your interest in painting but that painting supplies are not obtainable in your community. It so happens that I have been working for some thirty years trying to learn more about the nature of special ability, with particular interest in *artistic* aptitudes. We have been trying to find out how people differ in this ability. In one of these studies we acquired a considerable quantity of tempera powder, brushes, papers, etc., and had a good deal of it left over. . . . If you can use some of it you are welcome to it. Just let me know and I'll send it by parcel post at no cost to you.

On December 18, 1962, Calvin Larvie replied, "I have been here [the VA hospital] and have traveled quite a bit trying to find a place for myself to live. I have not succeeded in finding a place to live so I am here again." In response to Meier's questions he wrote:

> You wanted to know how I arrived at the positioning of the riders in space. I can only say I feel very close to my Sioux tribe and their beliefs, legends, myths I hold to be religious. I was so deeply inspired at the time I was lost in imagining how it should be. I finished it alone, with a smattering of thought given to something of correct composition and some thought given to colors that would give the idea of supernaturalness. When I was a small boy I followed herds of horses on foot, loving them, even wishing I was one of them. So you can understand I studied horses in every aspect of their daily lives. Even now I can see them anytime I want to (see Figure 12).

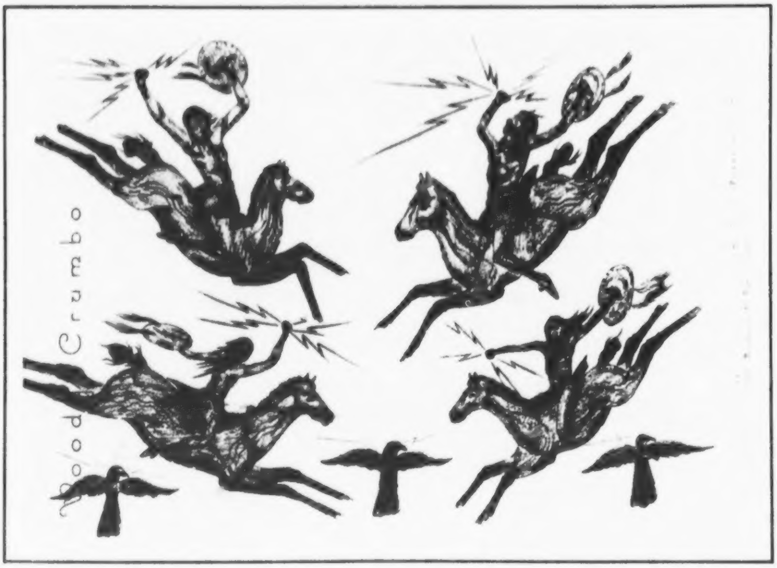


Figure 12. Sky People, by Sioux artist Calvin Larvie

Calvin Larvie had been a student of Woody Crumbo at Bacone College from 1939 to 1940. He wrote to Meier that Crumbo had been a great influence. Meier must have sent an inquiry to Crumbo, because on December 5, 1962, Crumbo apologized for his delay in answering. His letter seems to be a response to Meier's questions:

> [Calvin Larvie] discussed his ideas or plans for composing a picture very little if any. He simply started drawing on a clean sheet of paper, making his complete drawing in pencil before he started painting. He made this picture of the "Sky People" from an old Sioux legend concerning the spirits of warriors that control the storms—thunder, lightning, wind, and rain—these spirits are closely related to the legendary thunder birds. They ride spirit horses—colored blue to signify the spirit—also note they do not have hooves—denoting they float through the air—are spiritual.

Crumbo began his letter by stating that Larvie "was one of the finest students I ever had," and concluded that "His interest in art was evident while he was in grade school."

Calvin Larvie is one of the artists Meier described in his report (1965) to the U.S. Public Health Service. From 1962 to 1965, a grant of more than $11,000 by this agency supported Meier's travels to interview artists about their creative processes. Unfortunately, none of these interviews have survived in Meier's papers, nor were they published.

It appears, however, that artists were much more responsive, and certainly far less argumentative, when Meier requested information about the development of their work than they tended to be when the psychologist attempted to "inveigle" them into validating tests or to enlist their cooperation in taking IQ tests. Lyonel Feininger, for example, wrote to Meier in December 1940: "First and foremost, my desire was to paint a picture." He continued to explain that "Space itself was of greater importance than the physical object" in his painting of *Gelmeroda III*.

> The spire—in fact, the entire church—has a strong inclination toward the right. Sitting before this slender spire, and glancing from time to time upwards at it whilst at work sketching, I inevitably followed my feeling of its inclination upwards and away towards the right. This diagonal furnished the constructive key to all the objects. I need hardly say, as a painter receiving a strong impression, that distortion became actual truth, utter necessity, for the realization of my optical experience before nature.

It is a little surprising that a number of well-established artists were so generous with their time in responding to Meier's queries. Others appeared grateful for the psychologist's interest. However, it may be that Ralph Pearson spoke for many artists when he wrote to Meier, from West Nyack, NY, that "I fear we are talking two different languages." And so they were. But, because of their differences, they argued and clarified, explained and recommended, in letters that span more than 30 years. Meier's relationships with artists embody the paradox in which those who study art and those who make art find themselves. Rene Magritte described the situation in a 1966 letter to Michel Foucault in response to that philosopher's questions about one of Magritte's paintings: "The 'mechanism' at work here could serve as the object of a scholarly explanation of which I am incapable. The explanation would be valuable, even irrefutable, but the mystery would remain undiminished" (Foucault, 1983, p. 58).

Author Notes

This research was supported in part by the Graduate College of The University of Iowa.

The assistance of Steve McGuire, doctoral student in Art Education at The University of Iowa, is gratefully acknowledged.

All quotations, sources, and photographs, unless otherwise indicated, are from the papers of Norman C. Meier, housed in Special Collections at The University of Iowa Archives.

CHAPTER 9

Recent Inquiry and Testing of Children's Art Abilities

Gilbert Clark

The work of Norman C. Meier provides a model that has not been replicated directly since his career ended. His test development work, however flawed, and his long-term research program, involving numbers of others including his students, established a model and foundation for the study of talent in the visual arts. Dale Harris pointed out in 1963 that:

> To the studies of proportion, balance, design, symmetry, and the like, in children's drawings must be added the series of systematic studies carried out by Norman Meier and his students at The University of Iowa. It is to be regretted that these promising early studies were not followed by others (p. 214) [and that] even though [the Meier studies] are almost unique in the psychological literature, they can be said to have only begun to approach the subject. (p. 216)

Why were these early studies not followed by similar research programs at other universities and why was Meier's test development work a promising beginning without a follow-up? Part of the answer is a function of timing and other parts are found in the content of Meier's work. Test development for the study of art-related abilities had been actively pursued in the United States from 1919 to 1942, but the next two decades were empty, generally, of similar efforts. As a result, the promising, early beginnings of art-related test development by Lewerenz, McAdory, Knauber, Meier, Graves, and others failed to attract a new generation of researchers. The time-line on pp. 161-170 indicates a void in test development, with minor exceptions, from 1942 to 1966. During that 24-year period there were at least two major factors that worked against test development and the kinds of art-related research that had been conducted up to this time.

> Testing in the field of art education is not a common phenomenon. The discursive fields such as the physical sciences and the social sciences have long had a long history of testing. . . . This is not the case in the visual arts. The history of art education and the character of the philosophies which have guided its practice have not emphasized the discursive and attitudinal outcomes of art education. The major emphasis in art programs in most American schools, at least since the twenties, has been upon the productive aspects of art. The development of the student's creativity, the opportunity for self expression, the release of feelings, the exploration of media, these have been the primary concerns of art educators. (Eisner, n.d., p. 1)

Redefinitions of Art Education

A major factor influencing the time period from 1942 to 1966 was a generalized movement that redefined the purposes of art education. Art in schools had been taught to achieve "practice for skill development with tools and constructive satisfaction" (Lanier, 1983, p. 144) or "a dominant concern with the development of industrial drawing skills to a desire to enable children to develop taste and to experience beauty" (Eisner, 1972, p. 47). These emphases, and the various forms they took, dominated art instruction during the several decades prior to 1940. A new conception of the role of art in schools, however, was developing during this same period that was to culminate in a complete redefinition of the content of art education and role of the art teacher. Influences of The Child Study Movement at the turn of the century, early writings such as Arthur Wesley Dow's (1908) in the United States and Franz Cizek's in Austria (Viola, 1942), led to a new rationale for and conception of art teaching that emphasized psychological goals. "The dominant focus of these writings embodied belief in the developmental efficiency of self-expressive art activity, serving the ends of creativeness, wholesomeness of personality, and social adjustment" (Lanier, 1983, p. 145).

Several books about art education were published, reflecting this new conception of purposes and goals, that profoundly affected the practice of teaching art in schools. John Dewey's *Art as Experience* (1934), Natalie Robinson Cole's *The Art in the Classroom* (1940) and *Children's Art from Deep Down Inside* (1966), Florence Cane's *The Artist in Each of Us* (1951), Victor D'Amico's *Creative Teaching in Art* (1942), Viktor Lowenfeld's *Creative and Mental Growth* (1947) and *Your Child and His Art* (1954), Sir Herbert Read's *Education Through Art* (1943), and Henry Schaefer-Simmern's *The Unfolding of Artistic Activity* (1948) all called for a redefinition of art education in which psychologically founded goals would predominate. Teaching and, therefore, testing and measuring the acquisition of art-related content and skills, became secondary to a new set of concerns. Lanier (1983) describes this transformation:

> The art products of children were seen as significant data revealing both their intellectual capabilities and the quality of their adjustment to the problems of living. At the same time, working with art materials—necessarily, of course, in a free, uninfluenced, spontaneous manner—was thought to provide a unique and important means of emotional therapy and creativity in art. (p. 145)

Eisner described two phases in the adoption of child-centered art education. He points out that an earlier, Progressive Education, phase occurred during the 1920s and 1930s. During this time, art teachers were led away from the teaching of art-related content and skills toward a new set of beliefs and practices. Art teachers, during the Progressive Education era:

> were concerned with using art to unlock the creative potential each child was believed to possess . . . were committed to the idea that art ability unfolded, as a flower did, when the proper environment was provided . . . saw art as a tool for untapping the imagination and providing the child with nonverbal means of communication . . . viewed art as a field of activity to be integrated or correlated with the other fields of study in the curriculum . . . and wanted the art experience to flow from the needs and interests of the child. (1972, p. 51)

A Psychological Focus for Art Education Research

Harris (1963) recognized the emerging concerns of the 1940s and 1950s as psychological and adjustment oriented and Lanier (1983) recognized their realization in art classrooms as a focus upon free, uninfluenced, and spontaneous activities that purported to lead to "creativity in art" (p. 145). Eisner (1972) described an Age of Heroes in art education (1940 to the 1960s) dominated by writings, ideas, and teacher education that focused upon facilitation of "the creative development of the child [and] the use of art for personal development" (p. 56).

These influences led to many radical changes in art education; one was an anti-test bias that discouraged, and actively resisted, the use of tests in art classrooms. This was one major factor that worked against continuation of the work of Meier and other researchers and test developers. Another major factor was the nature of the early tests used in art education research and their lack of development in parallel to test development in other subject matters:

> Twenty and four-tenths percent of the 2,467 currently available standardized tests serve the needs of teachers of reading, writing, and arithmetic, while only .045 of one percent serve the needs of teachers of art. None of the 10 standardized art tests is diagnostic; it is currently impossible to diagnose an art student's educational needs through use of [any currently available] standardized art test. (Clark, 1982, p. 70)

Test development in support of art-related research failed to follow up its informal, casual beginnings to include diagnostic, achievement, or capacity tests. Early tests that are still nationally available as standardized, art-related tests include a limited number of tests developed as early as the 1920s, 1930s, and 1940s. These are:

> *Meier Art Tests: 1. Art Judgment* (first issued in 1929 and revised in 1940)
> *Meier Art Tests: 2. Aesthetic Preference* (first issued in 1963)
> *Horn Art Aptitude Inventory* (first issued in 1935 and revised in 1953), and the
> *Graves Design Judgment Test* (first issued in 1947 and revised in 1974; reissued in 1978).

These tests have been critiqued in several editions of the *Mental Measurements Yearbook* (Buros, 1938, 1941, 1949, 1953, 1959, 1965, 1972, 1978) and *Tests in Print* (Buros, 1974) and various aspects of these critiques have been reported by Eisner (1978), Gaitskell, Hurwitz, and Day (1982), and Clark and Zimmerman (1984). Basically, critics have noted that the tests are dated, fail to prove their assumptions, and fail as diagnostic or achievement tests. These tests do measure some aspects of the development of art abilities, but these aspects have not been adequately explained.

> Although standardized art tests are interesting and provocative, often they are not very reliable and do not apply to the specific needs of classroom situations. (Gaitskell, Hurwitz, & Day, 1982, p. 498)

As a result:

> None of the various testing instruments developed during this time [1920s to 1940s] has proved useful, nor does the writer know of any serious use of such instruments. (Inglehart, 1960, p. 123)
> It does not take long to discover that few tests are available in published form in the visual arts. (Eisner, 1972, p. 141)
> There are no completely satisfactory tests of aptitude in art, especially during the school years of individuals. (Khatena, 1982, p. 94)

Such statements are misleading though they do paint a dim view of testing and research in the visual arts that was reflective of the 1940s, 1950s, and part of the 1960s. There has been, however, a resurgence of test development over the last 20 years as well as a resurgence of interest in the study of children's art work. Recent researchers have used similar types of inquiry about children's art abilities that marked the first four decades of this century, often without studying the early research reported in Chapter 1.

Recent Test Development for the Measurement of Children's Art Abilities

In 1963, Norman C. Meier issued the second Meier art test, Aesthetic Perception. As noted earlier, this test was an outgrowth of the original test development work Meier conducted in the late 1920s. In this test, subjects viewed four variations of a single image, one based upon an artist's original and three modified versions of the original. Subjects were asked to rank the four images from the "best aesthetically" to the "poorest" (Meier, 1963, p. i). This test "is the second of a series of three tests of aesthetic sensitivity—a personality characteristic basic to success in art, creative achievement of various kinds, and other activities that require penetrating perceptual insight" (Meier, 1963, p. i). Despite this claim, a reviewer in *The Seventh Mental Measurements Yearbook* ended his review with this caution: "*Aesthetic Perception* is an experimental test probably measuring something related to artistic ability. The nature and utility of the functions measured are not clarified by the data reported in the preliminary manual"

(Siegal, 1972, p. 241). Once again, a standardized art test entered the market, and remains available, that measures an ill-defined aspect of children's art abilities and has failed to prove useful as a diagnostic or predictive, achievement or capacity test. Other researchers, however, have directed their attention to development of such tests though very few have entered the commercial market as standardized tests.

Recent Test Development in Art Education and Psychology Research

Elliot Eisner reported in 1966, development and use of the *Eisner Art Information Inventory* and *Eisner Art Aptitude Inventory*. With these two tests, Eisner was attempting to create instruments that could be used to measure students' bases of information and their attitudes about the visual arts. Original use of the instruments was conducted with 849 secondary school students and 636 college students. The secondary school student findings showed that neither information nor attitudes about art were changed substantially, at least as measured by these tests, across the 4 years of high school.

In a similar fashion, a number of researchers have developed art tests during the last 20 years for idiosyncratic use in their research. These include:

1966	Wilson, B.	Wilson Aspective Perception Test
1967	Eisner, E.W.	Drawing Characteristics Scale
1969	Silverman, Hoepfner, & Hendricks	Art Vocabulary Test
1970	Clark, G.A.	Visual Concept Formation Test, and Visual Concept Generalization Test
1972	MacGregor, R.	The Perceptual Index
1972	Salkind & Salkind	Aesthetic Preference Test
1976	Day, M.D.	Day Art Preference Inventory, and Day Art Judgment Inventory
1979	Savarese & Miller	Art Preference Test
1979	Youngblood, M.	Non-Verbal Ability Test
1982	Baker, D.W.	Narrative Drawing Assessment, and Visual Memory Assessment
1983	Silver, R.	Silver Drawing Test
1984	Clark, G.A.	Visual Concept Generalization Test (revised)
1985	Clark & Gareri	Clark-Gareri Drawing Instrument and Scale

One characteristic of the reports of research in which the above instruments were used is that the researchers obviously felt dependent upon their own instruments because they lacked commercially available resources to suit their purposes. This is unfortunate, but certainly describes the current situation. There is a great need for the instruments listed above to be used by other researchers and for their reliability and validity to be established and reported relative to use with larger audiences. In addition, the most valid and reliable instruments need to become commercially available in support of the types of research being conducted across the country. Only two of the tests listed above, the Art Vocabulary Test and the Silver Drawing Test, are currently marketed by test publishers.

A National Testing Program in the Visual Arts

A number of publications have reported results of the two *National Assessment of Educational Progress (NAEP): Art* (1977, 1981). The first national assessment of art was referred to as "the first comprehensive attempt to measure student achievement in art on a national scale at the elementary, junior high, and high school levels" (NAEP, 1977, p. 1). National Assessment of Educational Progress was administered by the Educational Commission of the States under a grant from the National Institute of Education. It was incorporated in 1983 into the work of the Educational Testing Service (ETS), a major test service and publisher. ETS now distributes all of the NAEP publications that report assessment results, procedures, and exercise sets for the areas of art, career and occupational development, citizenship, literature, mathematics, music, reading, science, social studies, writing, and other school subjects. The art assessment reports for a general audience include *Design and Drawing Skills* (1977) and *Art and Young Americans* (1981). These reports discuss results of art assessments conducted during 1974 to 1975 and 1978 to 1979. These assessments measured art production skills, art knowledge, and attitudes about art of 9, 13, and 17 year old students from throughout the United States. Related reports available from ETS include a *Procedural Handbook* and *Released Exercise Set*. These are a detailed description of all of the procedures used in the 1978 to 1979 art assessment and a set of test items that may be reproduced and used, along with scoring guides, by teachers and researchers anywhere in the country.

The assessments were designed by art educators and measured performance on five major art objectives:

1. Perceive and respond to aspects of art
2. Value art as an important realm of human experience
3. Produce works of art
4. Know about art, and
5. Make and justify judgments about the aesthetic merit and quality of works of art. (NAEP, 1981, pp. 79-84)

Each of these categories of objectives is divided into subcategories and a number of specific tasks for 9, 13, and 17 year olds.

Results of the assessments have been reported in several places, most notably in the reports and the *NAEP News Letter* (1977, 1978, 1981-82). The following statements summarize results of this complex assessment program:

> Students' taste in art shifted more toward the conventional and the realistic during the late seventies, with a corresponding decrease in the importance they place upon art. . . . Items assessing knowledge about art and art history—including when and where various works were created and recognition of familiar works—reveal that knowledge about art is not widespread. . . . Typical art curriculum in this country . . . generally emphasizes production of art works. . . . Despite this emphasis on producing art works, data from the NAEP assessment suggest that design and drawing skills are not particularly well developed. (*NAEP Spotlight*, 1981-82, p. 2)

Laura Chapman, Ronald Silverman, and Brent Wilson were asked by NAEP to review the art assessment results and comment upon their implications. Ward summarized their views:

> The art educators expressed dismay at many of the trends revealed in the art assessments, particularly the declines in teenagers' acceptance of a broad range of art forms, their slight knowledge of art history and their tendency to judge works of art on the basis of their subject matter or 'realism.' . . . Particularly disheartening to the art educators was the fact that 17 year olds who had taken four to six art classes held at best only a slight advantage over their peers in knowledge of art history or in ability to respond to and critique works of art. (1982, p. 17)

Though the results and these reactions may be seen as discouraging, they nevertheless provide a measure of art learning across the country that was not available before the art assessment testing instruments were designed and administered. They provide a model for art testing and reporting of student outcomes that also can be seen as encouraging and long overdue.

Recent Research and Inquiry About Children's Art Abilities

Parallel research and inquiry about children's art abilities has been conducted, based upon the study of children's art work rather than upon testing, during the more recent 1960s, 1970s, and 1980s. As in the past, this work has been conducted by individuals and organized teams of researchers, such as those at Harvard Project Zero who have cited Meier's earlier work as one of its foundations (Winner and Gardner, 1981).

The influence of a psychological orientation, rather than an aesthetic orientation, is apparent in the work of Schaeffer-Simmern (1948), Piaget and Inhelder (1956), Erickson (1963), Coles (1967), Kellogg (1969), Goodnow (1977), Freeman (1980), and Golomb (1973, 1974, 1981, 1983). These more recent researchers have sought patterns of child development in graphic representation at various ages, evidence of affective development or pathology, or of cognitive patterns such as the ability to follow sets of rules. Some have considered children's spontaneous drawings as a primary data source and have drawn their conclusions, as did earlier researchers, from analyses of these drawings.

A Psychologist's View of Young Children's Art Abilities

Claire Golomb (1973, 1974, 1981, 1983), in her many studies of child development during pre-school years, added a new dimension to the study of children's drawings. She reintroduced the controlled, experimental situation and, more specifically, the technique of interactive dialogue during the drawing process. Under Meier's direction, Grippen (1932) used this technique in a naturalistic inquiry in the early 1930s. Grippen talked with her school-age subjects while they painted and a stenographer recorded the dialogue. In combination with photographs of the art products, Meier referred to this technique as the 'constant contact' method and claimed that it yielded both a graphic and written record of creative experiences. Golomb has, by the use of controlled, experimental conditions and interactive dialogue during the process of drawing, disputed earlier claims by Kellogg (1969), Goodnow (1977), and Freeman (1980). She has, for instance, disputed Kellogg's claims of universal development of young children's drawings from undifferentiated scribbling, through units or diagrams, into combines and aggregates or figures. Golomb also disputes Kellogg's claim that early scribbles are nonpictorial and unaffected by the child's visual observations. Golomb has used cross-cultural research to disprove the claim of universality regarding a scribble to figure sequence in children's drawings and experimentally controlled, interactive dialogue situations to show that children's earliest marks on paper are intentional and meant to 'look like' a subject the child wishes to depict. The concept of intentionality is an important contribution and has led Golomb to question Goodnow's (1977) and Freeman's (1980) earlier search for simple rules or formulae to explain children's drawings. Golomb (1981) noted that "The child's drawing is determined by the *search for meaning* and likeness, but it is also constrained by the child's experience with the medium, by his intensity, motivation, attention span, and playfulness" (p. 47). In other words, even young children are attempting to depict something when they draw and very frequently are dissatisfied with their drawings because the drawing falls short of their expectations. They recognize that the drawings do not look like what they are attempting to draw.

Another important conclusion from Golomb's research has been to clarify a differentiation between children's drawing schema and their selection criteria. Whereas some have studied children's drawings as evidence of their aesthetic preferences, Golomb has shown that children's drawings proceed from a criterion of simplicity, but that their preferences or selections among images proceed from a criterion of complexity or realism. Golomb's work has raised many questions about conclusions drawn from previous inquiry and research and has helped guide questions raised by Harvard Project Zero in its multi-faceted approach to study of children's art abilities.

A Longitudinal, Group Research Project: Harvard's Project Zero

Project Zero, now in its eighteenth year, has involved many researchers in its long standing inquiry into children's cognitive and affective development. Founded by Nelson Goodman (1968) and codirected by David Perkins and Howard Gardner (1973, 1980, 1982, 1983, 1986), this project has acknowledged a debt to Meier's earlier work and, in fact, has been partially funded by the Carnegie Foundation, one of Meier's earliest supporters; other funding agencies include the Spencer Foundation and the National Institute of Education.

Though its staff has included philosophers and several types of psychologists, Project Zero has approached the study of children's art abilities and, specifically, children's drawings as problems related to aesthetic development (much as did Meier) rather than as evidence of other psychological states. Well over 200 publications, ranging from journal articles to edited, collected writings, to single author books, have been generated by Project Zero personnel; this in itself is evidence of the magnitude and productivity of this contemporary project. Much of the character of this work can be found by reading Gardner's *The Arts and Human Development* (1973), *Artful Scribbles: The Significance of Children's Drawings* (1980), *Art, Mind, and Brain* (1982), and *The Mind's New Science* (1986), as well as Winner's *Invented Worlds* (1982).

Winner and Gardner have written that:

> In an early set of studies, Meier and his associates (1933, 1936, 1939) raised the question of whether children's drawings possessed some of the properties of adult art works [and that] at Harvard Project Zero, we and our colleagues have been investigating the aesthetic status of children's drawings and their relationship to works of art produced by adult artists. (1981, p. 19)

At Project Zero, children's drawings have been studied based upon collections of spontaneous drawings (gross products method), on-line observation of children drawing (single subject or biographical method), and, recently, "it has become clear to us that the issue of the aesthetic status of children's drawings can only be pursued in depth if . . . we add drawings made under controlled experimental conditions" (Winner & Gardner, 1981, p. 19). Thus, with longitudinal, cross-sectional, and experimental metholodogies, the project staff has sought explanations of children's development in art, as well as in language, symbol understanding and use, and other cognitive functions. They have, by choice, not sought to answer questions about the effects of training or education on children's art development. They have been criticized for this as a failure to ask questions art educators and art teachers might ask and for reported findings that are inconsistent with the findings of art educators conducting similar research (Lovano-Kerr & Rush, 1982).

Brent Wilson and Paul Duncum have challenged interpretations made by Project Zero researchers of a "U-shaped" curve describing children's aesthetic development. The argument is that, by the criteria of expressive, spontaneous, and inventive characteristics, the art work of pre-schoolers is high, decreases to a low in primary grades, and only raises to another high in selected adolescent or high school students. This finding has been reported for graphic art work (drawing), creative writings, and three-dimensional clay work. Wilson (1981) points out that the criteria and assumptions of such research are wrong: "it is only in the century of abstract impressionism" (p. 32) that the U-shaped curve can have any meaning:

> The fact that Winner and Gardner might even consider that the productions of five year olds have more artistry than those of ten year olds seems to reveal more about the inquirer's aesthetic tastes in art than the facts of graphic development. (Wilson, 1981, p. 33)

Duncan (1986) proposes an alternative cultural model to Gardner's U-shaped curve theory in which each stage of development is valued equally.

Despite such criticism, the work of Project Zero is commended even by its critics as an ongoing project that deserves future support. Its conceptualization and continued attention to developing further understanding of children's art development and art abilities is invariably praised and supported. "Some rich areas of study have been uncovered by the imaginative research of Gardner and his associates that has not been fully appreciated or explored by art educators" (Sullivan, 1986, p. 29). "The work of Gardner and his colleagues is to be welcomed. It no doubt represents a significant contribution of our understanding of children's knowledge of the arts" (Rosario, 1977, p. 94). "Project Zero offers a model of . . . continuous and focused work. . . . We are inspired by Project Zero's productivity" (Lovano-Kerr & Rush, 1982).

Longitudinal and Cross-Cultural Research by Two Art Educators

Two art educators who have devoted an equal, or perhaps longer, amount of time than Project Zero to studying children's art abilities are Brent Wilson (1966, 1981) and Marjorie Wilson. They have co-authored numerous publications (1977, 1979, 1982a, 1982b, 1982c, 1984a, 1984b) that are a record of their longitudinal and cross-cultural research.

Two themes that recur in the historical reviews of inquiry, research, and testing of children's art abilities in this monograph are that much of this work lacks theoretical underpinnings or that the research and testing are inadequate to explain the phenomena studied. O'Hare (1981) previously has noted these two problems and reported that much of the research conducted previously has changed its focus frequently, thus failing to build accumulative findings and serve the needs of others. An exception to both these problems marks the work of Wilson and Wilson.

Throughout their work, Wilson and Wilson have asked whether or not children's graphic development, as evidenced in their drawings, unfolds through a series of universal stages from abstract simplicity to complex visual realism. They have investigated problems similar to those studied by Oliver (1974), Goodnow (1977), and Freeman (1980) as well as Golomb and the Project Zero staff. They have collected and studied children's drawings from several parts of the world and sought to describe innate and influence factors, including the influence of culture on children's art abilities. Their findings are consonant with the speculations of David Feldman (1980, 1985) that children's development in art, as in other aspects of behavior, has universal roots that are soon altered by the culture in which they develop. For Feldman, development beyond a universally or culturally determined stage is dependent upon consciously delivered instruction within a specific culture (1985).

Wilson and Wilson have noted that universality does not explain children's art abilities, but that acculturation and instruction are major factors in such development. They are certain that there is no simple or single explanation of children's drawing abilities but have documented the influences of culture and noted that much of this influence is developed by children's borrowing of conventions from other children and from visual depictions available in their environments. Wilson and Wilson believe that the graphemes, or marks children use to draw objects (Oliver, 1974), are learned as an interaction of universal, innate features and cultural or influence features. Continued speculation about a theoretical explanation of children's drawing abilities has marked their work for many years and has led Wilson and Wilson closer and closer to a theory of children's drawing abilities. This quest for a theory of child development in art stands in great contrast to most of the speculations and findings about children's art abilities that have been reported from Cooke's earliest writings, in 1885 and 1886, through Meier's and his associates' work during the 1930s and 1940s, and the more recent work reported since the mid-1960s.

Attention to Children's Art Abilities as a Focus of Research

Despite the pervasive influence of the child-art movement and its emphasis upon spontaneous, creative self-expression, art abilities, there has been a renaissance of interest in the investigation of children's art abilities since the mid-1960s. Through reiteration of many methods used much earlier, from 1885 to the early 1940s, researchers have developed and used art tests and/or have conducted inquiry about children's art abilities based upon study of children's drawings and other art work. A massive body of research findings has been amassed, though much of it is unfamiliar to the majority of art educators and others who wish to study and understand how children develop abilities in the visual arts. The primary purpose of this chapter has been to report and briefly describe selected work as foundations that exist for future inquiry, research, and testing of children's art abilities.

CHAPTER 10

Implications for the Future of Inquiry, Research, and Testing of Children's Art Abilities

Excerpts from a conversation held over 2 days among Gilbert Clark, Enid Zimmerman, and Marilyn Zurmuehlen

Thoughts About the Whys and Whats of Testing

M. One of the things I've been reading about is what I would call a climate for testing, what Banesh Hoffman in The Tyranny of Testing referred to as our national test mania. He wrote, "Unfortunately, we tend to be better at concocting excuses for giving tests than we are at making sense of the results. A test score is a number to conjure with, we see in it what we want to see, enabling us to capture a child in a three digit index. No one would presume to describe a child's mind in a single sentence but a number—124?—can say it all" (p. xv). That's not the whole picture of testing, but I think it explains why numbers are so appealing.

E. We have so many students applying to colleges and universities and testing is an economically feasible way of handling large groups of people by norming them according to standardized scores and seeing how they deviate or conform to a norm. People such as Meier used testing not only to compare groups of people, but also to find out about art preferences, aesthetics, and how people process information from the world. I think Meier used testing to add to a knowledge base, whereas other people use testing to manipulate, as Hoffman said, or because tests are feasible economically.

G. The thing that we lost track of at the end of Meier's time is testing in the service of research, getting information that wouldn't exist otherwise, and testing in the name of understanding children. We make all kinds of assumptions and don't have hard evidence that those assumptions are either correct or incorrect, appropriate or inappropriate, because we don't have research findings that give us accurate information.

M. I don't believe there is a big push to do more research testing in education, or in art education, nationally. The push that I sense comes from political pressures to do more applied testing that demonstrates achievement or assessment. The kind of test enthusiasm we read about, at the moment, in newspapers and magazines is based on demonstrating achievement. I don't think the general public is caught up in a great desire to see more educational research testing. Books and articles that have national circulation more often are directed toward either advocating or questioning screening or achievement tests; these are the focus of most of the criticism and controversy.

G. I remember, years and years ago, when Max Rafferty was state superintendent in California he came out with the idea that they were going to give standardized achievement tests and punish any schools below the mean and reward all schools above the mean. That doesn't make any sense, because no matter how scores are distributed, there will always be 50% below and 50% above the mean. You can't change that proportion by rewarding or punishing.

M. One of the things that people fear about tests is how outcomes will be used, which is a moral, ethical, and intellectual question. I think people sometimes get so caught up with testing itself that they forget there are things we want to know that we can find out by a fairly direct means and for which we don't need to devise a test.

E. I agree; it's a good point. Interviews and observations are very good procedures, but they are time-consuming and expensive, so combinations of procedures should be used. Probably one of the best means of understanding art students is to watch them when they work and observe what they do.

G. Lee Cronbach says a test is a systematic procedure for comparing the behavior of two or more persons. He's writing about psychological tests with a very broadly conceived notion. We should establish what we mean by pencil and paper tests as compared to having students come in a room and paint a painting and diagnosing that painting. Testing also includes giving certain forms of biographical inventories and other screening devices, including interviews and observation. But, are we including all of these in the concept of testing?

E. Testing is a very large term; it has many facets.

G. Yes, we've touched on evaluation, measurement, achievement, diagnosis, and screening, what else? All of these bear on the use of tests.

Considering Some Types and Uses of Tests

G. If we're talking about using tests to screen people or place them in a program, then we are talking about one use of testing. If we're talking about tests as diagnostic instruments, prescriptive instruments, or information gathering instruments, we are talking about a wholly different situation. If you look at the tests that we describe in this monograph, I would say a very high percentage are not intended as screening tests, they are intended as information gathering, operational tests to either research or evaluate an ongoing program.

E. I don't think that anyone would have an argument with testing to learn more about child development and child growth. I think where the argument comes is whether tests should be used as screening procedures or achievement procedures to see if students learn something over a period of time.

M. Certainly some people have reservations or concerns. I think, for example, of people who are phenomenologists, who are existentialists, who would say that any kind of situation that is nonnaturalistic, that is nonspontaneous, that is contrived by someone else is not as rich a possibility for our understanding as one that is more contextual.

G. To see whether students learn something is a commendable outcome as long as it isn't used to put students into categories. Teachers do want to know if what they taught has been learned. In reading, math, and other subject areas, diagnostic tests are used to find out where the students are in order to plan the next several weeks of instruction. That becomes very specific. In reading, for instance, there are paragraph construction diagnostic tests, spelling diagnostic tests, grammar diagnostic tests, and other kinds of tests.

E. Teachers can use testing for pretesting the first day of art class. I tell my preservice students that they should give some kind of test such as telling their art students to take off a shoe and put it on the desk and draw it. Then, they can see at which stage individual children are in drawing development and how they compare with the group. Of course, teachers shouldn't judge from just one assignment. They should look at children who are not able to do the task, those who have great skill, and those who are in between these extremes, to individualize their curriculum.

M. There's another possibility; it is that evidence should be revealed to the students and not only to the teacher. Beittel's notion of photographic feedback is an example. He, or a graduate student, sat down with the student whose work had been photographed in process, and together they had a dialogue, the two of them. Through photographs and discussion, the student's previous work and processes became known to the student as well.

G. I don't think art is that different. If an arithmetic teacher gives a diagnostic test and has the students grade the test to determine their errors, they are doing the same thing.

E. There are no standardized tests to determine whether children learn something in art from one grade to another even if we don't compare them one against the other but compare them to themselves. We have no standardized way of checking whether students are learning anything in art classes.

G. One of the reasons is that something like the SAT, that is standardized, is supposedly grounded in the public school curriculum. There is no common curriculum in art and no common assumptions that can be made about a student's background. Therefore, it is difficult to test art learning.

M. Many people would say we are fortunate in not having the SAT model, fraught as it is with problems of interpretation and construction.

One of their points, and I think it's a fairly good one, is that we sometimes mistake something that lends itself very efficiently to numerical scoring as being objective; the fact that it's reduceable to numerical scores doesn't necessarily make it any more objective than tests or criteria that aren't.

G. Let me respond to both of those things. I don't want to come out unequivocally pro-test, but one of the advantages of having a standardized test such as the SAT is that you can prepare for it. If there are 20 idiosyncratic tests, students would never know what criteria are going to be used. A young person going into a situation in which there are a number of idiosyncratic tests is in a wholly untenable position; he or she cannot prepare.

E. There is no standardized way of testing to see whether students have learned anything about art. So, art is not taken seriously as a school subject.

M. We don't take art seriously because there are no tests?

E. No, the *public* doesn't think of art as a purposeful subject, because there are no art tests. We as art educators believe that art is worthwhile in and of itself. We have to convince the public of this.

G. Put another way, if it's in an achievement test, it's considered important enough to be taught. Since art is not included in the achievement tests, it is, therefore, not an important subject for the public.

M. One reason some people are interested in using tests is for accountability to show to administrators and school board members that there is validation of what has been accomplished. Another reason, though, is that people are interested in selecting students for gifted and talented programs. Recent interest in art testing seems to have a fairly short history that I can trace to the passage of laws funding gifted and talented education.

E. I would agree that the recent interest in art testing is, in part, due to funding of gifted and talented programs. If you want to include more students rather than fewer students in programs for those who are talented in art you can use first-come, first-serve procedures. Everybody who wants to get into an art program can, using this method. You can eliminate some applicants by using observation forms that teachers fill out and forms that students fill out about their interest in studying art. Fewer students will be admitted to a program if interviews, portfolios, and observing students in the classroom are used as screening devices. If you have a gifted and talented program in the arts and there are 50 places and 250 students applying, you really cannot observe or interview all of them because there's not enough funding or time. How do you decide who's going to be in the program and by what means? One caveat, especially in the arts, is that you should never use one measure to try to test for something. One premise of *Understanding Art Testing* is that we all came to a certain phenomenon from many points of view. I think it should be the same with testing. There should be many ways of testing to understand a phenomenon. What we're talking about is many ways of testing art ability to understand a child's talent in the visual arts.

G. One of the things we were talking about earlier was the many different ways people view students and testing.

E. The concept of testing shouldn't be rigid, static, or stagnant. The idea of testing the waters is appropriate; you can put your toe in and there are many ripples. Some people will argue that unless you have objective measures and statistics you are not testing. Hopefully, more progressive people in art education are thinking that there are many ways of looking at the world, as we looked at Meier's world. I think the future for testing means that we will learn to use many assessment measures to build upon what we know about children and their art work. When I went to school and took art education courses, I don't think there were many books about testing in the art classroom and testing wasn't stressed. People who now are in the field as senior teachers were not educated to test and use test results.

Thinking About Tests as Research Devices

G. One thing we haven't talked about at all, that is all through this monograph, is using tests as research devices simply to divulge information that doesn't exist in the literature. I'm thinking, for instance, of those early researchers who gave standardized instructions and gathered drawings from students. They wanted to know whether culture made a difference in children's art work. They used tests as research devices, to gather information that didn't exist previously.

E. We're talking about using devices and inquiry methods to help understand child development, talent, and normative behavior, and that's quite different than using tests as screening devices.

G. If you take the Robert Stake form of naturalistic inquiry, tests have a place. Most people don't use tests in their naturalistic inquiry and naturalistic methodology and therefore testing is not equated with this system of inquiry.

M. I think of Burkhart's book, *Identity and Teacher Learning*, that presents a model for observation, interview, dialogue, and interpretation, going back to the student again with your interpretations, and going back over your own interpretations. We do have some models for that kind of inquiry.

G. Yes, we have some good models.

M. That particular one is directly curriculum oriented, its purpose is to make some inquiry about methodology and show how a teacher can make interpretations and help students plan where they want to go next, on the basis of those interpretations.

G. What I'm saying is that we, in our literature, make all kinds of statements, a huge percentage of which have no foundation in testing or research.

M. Give me an example of one of those.

G. Hollingworth and other people have written that there is no correlation between art ability and handwriting. We don't know whether or not that is true or false at this time, because we don't have research that would prove this assertion.

E. I think the controversy about IQ and ability in art is still not resolved. Some people believe that you don't have to have a high IQ to do well in art. I think that if we knew more about that issue, we would be better able to identify and understand how art talent correlates with other measures. This is an issue that research can help us understand. We need more hard data and more research to tell guidance counselors that artistically talented students are bright and can read and write quite well. We need much more research in our field and it should be a variety of research inquiries that confront a problem from different points of view. I think that's the only way that testing will have meaning. I think we need an expansive view of testing.

Reflecting About Curriculum and Testing

M. If we want to talk about perversion of an idea that started out, presumably, with high pedagogical aims, but deteriorated, consider the New York Regent's Exams. Teachers tried to surmise from previous years' tests what would be on the exam and taught that information. The test maker under this system becomes the curriculum planner. Such a premise denies the professionalism of individual teachers. Externally constructed tests place the authority for what constitutes knowledge, and the best available knowledge for a particular group of students, in a specific place at a given time, in the hands of people who are not as well prepared to assess that as a professional teacher who is present in the classroom. Advocates of externally constructed tests say that people who write the tests do indeed know more about art than teachers who are in art classrooms.

G. I realize there are certain local exceptions, but by and large, reading teachers are not advocating that argument; reading teachers are going to use publicly printed reading tests.

M. The issue I'm raising is the unsuitability of standardized testing for organic approaches to curriculum.

G. I can't argue that, although even in an organic system there is a place for well prepared tests.

M. Not necessarily; what I'm saying is, I'm not certain that in an organic system there is any place for external standardizing. The fundamental issue here is the relationship between a teacher and a learner. The standardized curriculum approach situates the teacher-learner relationship as one in which the teacher is a kind of purveyor, a purveyor of information, a purveyor of materials, and not a true professional. An organic approach to curriculum posits the teacher-learner relationship as first of all, idiosyncratic, specific, and particular; so, it vests a great deal more authority in the teacher. Although the teacher is assumed to be an educated person, the relationship between a teacher and student often is seen as reciprocal, one in which both teacher and student are learning.

E. If you have a standardized curriculum, compared to an organic system, supposedly everybody is learning fairly similar things and using similar materials. You then can evaluate and have a testing program to find out whether students learned anything. That's the mode in reading, science, and math, although it is not the mode in art.

M. People who advocate an organic approach to curriculum find that irreconcilable with standardized, external tests. People who advocate some kind of standardized curriculum find that concept much more compatible with standardized tests.

G. If you are going to take that stance and push it to the extreme, you have a problem that I think we have now in our field as a whole. We have a lot of locally developed tests that other teachers are not able to use, understand, or view as appropriate to their needs. If you are anti-testing, you might say that's fine; if you are pro-testing, you can't support that situation and be comfortable because test results have more meaning as they are used with larger and larger groups of students.

M. Of course, I would suspect that there are people who are opposed to certain kinds of tests under certain conditions and maybe there are people who are opposed to any sorts of tests. My own experience leads me to believe that there may *not* be a group of people who are pro-testing, regardless of what the test is or what it's being applied to.

G. The field of art education seems to me to include people who are anti-evaluation, anti-testing, anti-all these things. They would be the people who would advocate what you're calling the organic curriculum. There are people who say that children's art would should never be evaluated; they believe that, philosophically.

M. Yes, I think that's true, although they would not be averse to having children's art work evaluated in terms of how committed they were to a project, how involved they were with the art.

E. People in the visual arts are interested in process more than perhaps people in areas such as reading or math. I think art people, to some extent, are fairly process oriented and would be interested in ways of testing or understanding the pre-involvement behaviors of students.

M. What's a pre-involvement behavior?

E. Someone who shows an interest in the area of art by looking at art, talking about art, taking out books about art, and being inquisitive about art.

G. I know an art teacher who taught in a school where art was not respected. One of the ways he went about changing that was to give art tests in his classroom, including vocabulary tests, skill tests, and information tests, and taking the results to his principal as often as possible. He literally turned the principal around in terms of support of the art program by showing test results in his art program.

M. I'm going to tell another story. I observed that when some people finished teacher education programs in art, within the first year of their teaching they were dittoing tests that had questions on them such as, "Red and yellow mixed together make ______." They went out into the schools and felt left out; other people were giving tests. Maybe they were the only art teacher in the building and they wanted to say, "I'm a teacher, too." It may have seemed that part of being a teacher is typing dittomasters, running them off, grading them, and having scores. So they asked questions like red and yellow make what, which is sort of a strange thing to be asking in a room where it's very easy to see whether or not students have an understanding of what red and yellow make when they are painting. I think sometimes we forget that tests are purported to be symbols, that they represent something we would like to know about and cannot know about directly, so we try to find out about it indirectly. We sometimes reify those symbols to become ends in themselves, which is what I think happened to the teacher I was describing. Now the teacher you were describing went about that consciously and intentionally.

Questioning Test Applications

M. There is another point that we ought to discuss; test results can give group information and they can give individual information. Some people try to take information that is relevant only to groups and apply it to individuals; that's one of the reasons we have such difficulties with test interpretation, not only as parents or teachers, but also in the news media across the country.

G. In the back of several art methods textbooks, there are groups of statements that "children in a specific grade will . . ." The result is a list of art behaviors. We need methods to gather information and verify such educational phenomena that are based on the results of research and testing. We can't prove these assertions at this time. One child's drawing isn't going to tell you the whole picture unless we have a norm to compare it to.

M. But aesthetically oriented persons, granted that they have in their minds all kinds of other examples that they are comparing it with, would not necessarily have some norm base comparison in order to arrive at a decision that it is an aesthetically fine piece of work, regardless of the child's age.

G. I don't deny that, but in the context of testing, if we don't have a reference base we cannot categorize or evaluate the drawing. Granted, you could assess its aesthetic qualities or you could assess it as an expression of that particular child's psycho-motor ability, but in the context of testing it doesn't have meaning unless you have a reference system.

M. But some people get confused about the meaning it has within that reference system. For example, you can know those norms but you won't, by knowing a particular child's age, know what her or his art will be like.

G. Granted, one of the things that is needed is taking standardized art activities and showing examples of below average, average, and above average work at given grade levels. If we had a system like that, any given drawing could be put up as a comparison. Without such a system, a drawing is simply a drawing, it has no comparative. Now it seems to me that an art teacher can set criterion references and say students do achieve the criterion or they don't. It's not a distributive norm base. It's not saying that students get an A, or a B, or a C, or a D, but perhaps the students all met the criterion and they all get As. The art teacher perhaps more than other teachers can set those kinds of criterion-reference systems.

E. Criterion-reference systems don't exist for grading art work.

M. I have always thought that one of the advantages of being an art teacher is that you do have the prerogative of making more decisions than some other teachers.

E. The shortcoming of that is that you cannot show gains in your class against another class in your school or against another school.

G. A coach can say, "I want you on my team," or "I don't want you on my team," and the orchestra teacher can say, "I want you in my orchestra," or "I don't want you in my orchestra." They do that on the basis of criterion attainment. Athletic training is closer to a criterion-referenced system than, for instance, reading teaching.

M. In what sense does someone teaching reading not use criteria?

G. They use criteria, but tend to norm references rather than criterion references. They teach students to read and then give a reading test: they compare the results to standardized results for that reading test and, therefore, become norm referenced.

M. One way of teaching reading is listening to children read and make judgments about their reading facility, understanding, ability to pronounce a word, what kinds of mistakes they are making, and so on. It seems to me reading teachers are constantly dealing with criteria and it's only because someone else decided they have to give reading tests that they move into norm references and away from criterion references. It strikes me that most reading teachers actually have been grounded in and practice criterion referencing.

E. Art teachers only have criterion reference testing for assessment, diagnosis, or whatever between norm and criterion reference testing. They don't have that choice. I think criterion referenced testing has a lot of validity in the art classroom as a preassessment to assess where children are and, at the end of the semester, to measure what they have learned.

Considering the Politics of Art Testing

G. If you take the political value of testing in art, I think you can justify many practices. We complain about the crucial role of the art teacher and art classes. We can improve that role with the kind of evidence that's available through testing. This monograph reports that there have been people doing testing through history and others who haven't and it's probably going to continue that way.

E. Certainly, some people are using more quantitative methodology and others more qualitative methodology.

G. Sure, and that's going to continue, too, because different people are educated differently.

M. When we talk about test scores being politically valuable, people who've had unsuccessful test scores aren't going to find testing politically advantageous. Beyond that, there are other politically advantageous kinds of evidence that art teachers can collect and demonstrate that may or more not be test scores. There's been a long tradition of student exhibitions of art work that is evidence of what has happened in their art programs.

E. You might be able to show locally what you are doing is fantastic and wonderful, but when you measure your students' art work against art work in other parts of the country your students' work may not be considered so successful.

M. If curriculum is specific to people at a given time and place, then what someone is doing successfully in another situation with another group of people is interesting to me, but does not oblige me to do that any more than what I am doing obliges them to do that particular thing. I think what we need is more dissemination of possibilities that people might consider for their situations rather than some test result. In other words, I believe more in that kind of generalization than I do in the generalization of a particular testing score across groups of people.

E. If teachers are testing in a particular local situation, there's nothing wrong with subjective measures. There are some things that you can quantify and that quantification tells you one thing; you have to look at it with knowledge of what the numbers mean. There's a whole other way of understanding the world; if a teacher gives a standardized test in reading, the result doesn't necessarily demonstrate what a student has accomplished in reading. The student may have made great gains for him or herself even though the test doesn't show these gains. I think the teacher always needs to see the whole picture.

G. We make all kinds of statements about what is, what should be, what ought to be, what we hope will be. We make statements about what students do and don't do, and most of the time we base such statements on our own local experiences and situations because we have no other information.

M. But we shouldn't assume that what we have from our own local experiences is not useful information.

G. What I mean is the information we have is of genuine validity *only* in our local situations and that places us at a huge political disadvantage in the school systems. There has been a lack of investment in wanting to know what's going on in art classrooms across the country.

E. You need people who use some external measures that can be expressed in public ways so others can understand. If we become completely idiosyncratic, however, and everybody only judges his or her own art class in a personal way, then I think that kind of system becomes too subjective.

Reflecting About the Future of Art Inquiry, Research, and Testing

E. If we had a crystal ball, do you see the future as groups of art students sitting in long lines in different halls taking tests along with their counterparts in science and math?

G. That's an awful image because it's a caricature of what's bad about testing. Testing goes on in every classroom in the country, every day, in an information sense, and that's not a bad image. Every teacher uses criteria to judge what happens in his or her classroom every day and they're measuring students against that criterion yardstick all the time.

M. What I would call the fund of all their previous experiences is what teachers draw upon in informal kinds of assessments. Even when a teacher says to a young child, "Tell me about your picture," that question comes out of the fund of all the experiences the teacher has had with art, with children making art, and with talking about art. How teachers think about what the child says back to them is always in relationship to all of the life experiences they've had—their readings, their talks with other people, not only their art making and teaching experiences.

E. The field of art education is beginning to see a resurgence of qualitative research. I say resurgence because Meier and other researchers used what we now call more naturalistic methods of inquiry. Perhaps we see a recycling back to acceptance of other methods. The stereotype of testing as a mechanical device to find the most talented students, to get them out into the work force, and to help our country beat the Soviet Union in the arms race may no longer be applicable. When we talk about the future of testing, what kind of testing are we talking about? I think that testing is going to be different than the awful stereotype. Is art going to be included and is art testing going to be different than other kinds of testing?

M. I think we should assume the prerogative to make art testing, if there is art testing, what we think it should be, rather than assuming that it simply will tag along with whatever is the prevailing, popular notion in other subjects. I would like to see some concerted effort to educate people who use test scores and other kinds of evidence to consider their bases for having belief in any of those forms of evidence. People often are mystified by numbers to the point where they don't examine the meaning of these numbers. One of the things I think we ought to acknowledge is that there has been a fairly long tradition of asking people, even at young ages, to look at their own or someone else's art work and reflect upon it, interpret it, articulate what it was they were trying to accomplish, and how they felt about whether it was accomplished. The critique, or self-critique, is a way of learning about students and their art work and other people's art work. I see the critique as a possibility for inquiry that people can build upon in the future. Commonalities among critiques would be a little like what you're hoping for when you talk about standardized testing, giving some basis for making comparisons of a person with his or her past or of that person with other people in a group.

G. Critiques are useful, of course; I don't think they can be equated with standardized testing. One of our disadvantages in the public schools is that we assume and do things essentially without a foundation in research. It seems to me we're talking about a spectrum. Some people say we ought to have standardized measures. Other people say children's art should not be evaluated, I don't believe in tests, every child has the right to express what he or she wants to express, or that children's art work should not be compared to other children's art work. Testing is obviously on one side of the spectrum. One group would say there are no tests in the future, the other group would say we need more tests in the future.

Selected Chronology of Publications: Inquiry About Children's Drawing Abilities and Testing of Art Abilities

Gilbert Clark

Each date, author, and test title refers to a publication that can be found in the References.

	Inquiry About Children's Drawing Ability	*Tests to Measure Children's Art Abilities*
1885	Cooke, E.	
1886	Cooke, E.	
1887	Ricci, C.	
	Lichtwark, A.	
1888	Perez, B.	
1889		
1890	Binet, A.	
1891	Passy, J.	
1892		
1893	Herrick, M.A.	
	Shinn, M.W.	
	Barnes, E.	
1894	O'Shea, M.V.	
	Baldwin, J.M.	
1895	Maitland, L.	
	Barnes, E.	
	Bailey, H.T.	
	Sully, J.	
1896	Lukens, H.T.	
1897	Brown, D.D.	
	Judd & Cowling	

	Clark, A.B.
	Clark, J.S.
	Barnes, E.
1898	Gotze, K.
	Graewe, H.
1899	
1900	Partridge, L.
	Chamberlain, A.F.
1901	Schuyten, M.C.
1902	Barnes, E.
	Partridge, L.
	Burk, F.
	Clark, A.B.
1903	Fischlovitz, A.
1904	Partridge, S.
	Schuyten, M.C.
1905	Kerschensteiner, G.
	Lobsien, M.
	Levenstein, S.
1906	Lamprecht, K.
	Stern, W.
	Findley, M.E.
1907	Stern, W.
	Lobsien, M.
	Findley, M.E.
	Judd & Cowling
	Sully, J.
	Schuyten, M.C.
	Clamparede & Geux
1908	Kohler, F.
	Sully, J.
	Kik, C.
	Barnes, E.
	Albien, G.
	Ivanof, E.
1909	Betts, G.H.

	Binet, A.	
	Elderton, E.	
	Ivanof, E.	
	Broerman, E.	
1910	Katzaroff, M.S.	
	Kretzschmar, J.	
	Bonser, F.G.	
	Stern & Stern	
1911	Stern, W.	
1912	Ballard, P.B.	
	Meumann, E.	
	Bailey, H.T.	
1913	Ballard, P.B.	
	Duck, J.	
	Rouma, G.	
	Luquet, M.G.	
	Thornkike, E.L.	A Scale for the Merit of Drawings by Pupils 8-15 Years Old
	Grosser & Stern	
1914	Meumann, E.	
1915	Childs, H.G.	
1916	Ayer, F.C.	
	Rugg, H.D.	
	Sargent & Miller	
	Thorndike, E.L.	Esthetic Appreciation Test
1917		
1918	Hartlaub, F.	
1919	Manuel, H.T.	(See Chapter 1)
	Dewey, J.	
	Whipple, G.M.	
	Whitford, W.G.	Whitford Appreciation Test
	Buhler, K.	
1920		
1921	Burt, C.	
1922	McCarty, S.A.	
	Kline, L.W.	

	Kline & Carey	
1923	Kline & Carey	Kline-Carey Measuring Scale for Freehand Drawing
	Thorndike, E.L.	Scale of General Merit of Children's Drawings (revised)
1924	Goodenough, F.	Draw-A-Man Test
	McCarty, S.A.	McCarty Drawing Scales
1925		
1926	Meier, N.C.	
	Goodenough, F.	Goodenough Drawing Scales
	Hartman & Schumaker	
	Christensen & Karwoski	Art Appreciation Test
1927	Lewerenz, A.S.	Lewerenz' Tests in Fundamental Abilities in the Visual Arts
	Wulff, O.	
1928	Beck, O.W.	
	Meier, N.	
1929	Meier & Seashore	Meier-Seashore Art Judgment Test
	McAdory, M.	McAdory Art Test
1930	Cockrell, D.L.	
	Hartlaub, F.	
	Saunders, A.W.	
1931	Eng, H.	
	Todd, J.L.	
	Jasper, C.C.	
	Goodenough, F.	
1932	Knauber, A.	Knauber Art Ability Test
1933	Lark-Horovitz, A.	The Seven Drawing Test (Munro, et al., 1942)
	Daniels, P.C.	
	Rodgers, F.	
	Dow, M.L.	
	Tiebout, C.	
1934	Meier, N.C.	

1935	Knauber, A.	Knauber Art Vocabulary Test
	Graewe, H.	
	Horn, C.F.	Horn Art Aptitude Inventory
	Griffiths, R.	
1936	Saunders, A.W.	
	Tiebout & Meier	
	Anastasi & Foley	
1937	Kerr, M.	
	Lark-Horovitz, B.	
	Nicholas, Mawhood, & Trilling	Informal Objective Test
1938		
1939	Ellsworth, F.F.	
	Lowenfeld, V.	
	Cane, F.	
	Varnum, W.H.	Selective Art Aptitude Test
1940	Meier, N.C.	Meier Art Tests: 1. Art judgment (revised)
1941		
1942	Lark-Horovitz, B.	
1943		
1944		
1945		
1946	Graves, M.	Graves' Design Judment Test
	Varnum, W.H.	Selective Art Aptitude Test (revised)
1947	Alschuler & Hatwick	
1948	Schaeffer-Simmern, H.	
1949		
1950		
1951		
1952	Lowenfeld, V.	
1953	Horn, C.C.	Horn Aptitude Inventory (revised)
1954		
1955		
1956		

1957		
1958		
1959	Kellogg, R.	
1960		
1961		
1962	Burkhart, R.C.	
1963	Meier, N.C.	Meier Art Test: 2. Aesthetic Perception
	Harris, D.	Harris' Draw-A-Man Test (Goodenough, revised)
	Erickson, E.H.	
1964	Coles, R.	
1965		
1966	Eisner, E.W.	Eisner Art Information Inventory
	Eisner, E.W.	Eisner Art Aptitude Inventory
1967	Arnheim, R.	
	Eisner, E.W.	Drawing Characteristics Scale
	Lark-Horovitz, Lewis, & Luca	
1968	Goodman, N.	
1969	Silverman, Hoepfner & Hendricks	Art Vocabulary Test
	Kellogg, R.	
	Arnheim, R.	
1970	Clark, G.A.	Visual Concept Formation Test
	Clark, G.A.	Visual Concept Generalization Test
1971		
1972	Beittel, K.R.	
	MacGregor, R.N.	The Perceptual Index
1973	Salkind & Salkind	Aesthetic Preference Test
	Lewis, H.	
	Clark, G.A.	
	Gardner, H.	
	Golumb, C.	
1974	Graves, M.	Grave's Design Judgment Test (revised)

	Golumb, C.	
	Arnheim, R.	
1975	MacGregor, R.N.	
1976	Day, M.D.	Day Art Preference Inventory
	Day, M.D.	Day Art Judgment Inventory
1977	National Assessment of Educational Progress	Art Assessment, 1
	Goodnow, J.	
	Willats, J.	
	Wilson & Wilson	
1978	Graves, M.	Graves Design Judgment Test (revised)
	DePorter & Kavanaugh	Match-To-Sample Test
1979	Savarese & Miller	Art Preference Test
	Youngblood, M.S.	Non-Verbal Ability Test
	Carothers & Gardner	
	Wilson & Wilson	
1980	Freeman, N.	
	Gardner, H.	
1981	National Assessment of Educational Progress	Art Assessment, 2
	Winner & Gardner	
1982	Baker, D.	Visual Memory Assessment
	Baker, D.	Visual Narrative Assessment
	Gardner, H.	
	Winner, E.	
	Wilson & Wilson	
1983	Silver, R.	Silver Drawing Test
1984	Clark, G.A.	Visual Concept Generalization Test (revised)
	Clark & Zimmerman	
	Wilson & Wilson	
1985		
1986	Clark & Zimmerman	Clark-Gareri Drawing Assessment Scale
		Clark-Gareri Drawing Instrument
1987		

1988
1989
1990

REFERENCES

Albien, G. (1907-1908). Der Anteil der nachkonstruierenden Tatigket des Auges und der Apperception an dem Behalten und der Wiedergabe einfacher Forman [The construction activity of the eye and apperception in remembering and reproducing simple form]. *Zeitschrift fur experimentelle Padagogik*, *5*, 133-156; *6*, 1-48.

Alschuler, R.H., & Hatwich, L.W. (1947). *Painting and personality*. Chicago: University of Chicago Press.

Anatasi, A., & Foley, J.P. (1936). An analysis of spontaneous drawings by children of different cultures. *Journal of Applied Psychology*, *20*, 689-726.

Arnheim, R. (1966). *Toward a psychology of art*. Berkeley, CA: University of California Press.

Arnheim, R. (1969). *Visual thinking*. Berkeley, CA: University of California Press.

Arnheim, R. (1974). *Art and visual perception*. Berkeley, CA: University of California Press.

Ayer, F.C. (1916). The *psychology of drawing with special reference to laboratory teaching*. Baltimore, MD: Warwick and York.

Bailey, H.T. (1895). Report on industrial drawing. In the *Fifty-eighth Annual Report of the Board of Education*. Boston, MA: Boston Board of Education.

Bailey, H.T. (1912). Drawing. In *Monroe's Cyclopedia of Education: Vol. 2*. New York: Macmillan.

Baker, D. (1982). Visual memory assessment and visual narrative assessment. In E. Lazarus (Ed.). *Project art band: A program for visually gifted children* (pp. 11-18). Lincoln, MA: DeCordova Museum.

Baldwin, J.M. (1894). *Mental development in the child and in the race*. New York: Macmillan.

Ballard, P.B. (1912). What London children like to draw. *Journal of Experimental Pedagogy*, *1*, 185-197.

Ballard, P.B. (1913). What children like to draw. *Journal of Experimental Pedagogy*, *2*, 127-129.

Barnes, E. (1893). A study on children's drawings. *Pedagogical Seminary*, *2*(3), 455-463.

Barnes, E. (1895). The art of little children. *Pedagogical Seminary*, *3*(2), 302-307.

Barnes, E. (Ed.). (1897). *Studies in Education: Vol. 1*. Stanford, CA: privately printed.

Barnes, E. (Ed.). (1902a). *Studies in Education: Vol. 2*. Philadelphia, PA: privately printed.

Barnes, E. (1902b). The prettiest thing. In E. Barnes (Ed.), *Studies in Education: Vol. 2* (pp. 180-194). Philadelphia, PA: privately printed.

Barnes, E. (1908). Child study in relation to elementary art education. In *Art education in the public schools of the United States, American Art Annual*, 101-132.

Beck, O.W. (1928). *Self development in drawing as interpreted by the genius of Romano Dazzi and other children*. New York: G.P. Putnam's Sons.

Beittel, K.R. (1972). *Mind and context in the art of drawing: An empirical and speculative account of the drawing process and the drawing series and of the contexts in which they occur*. New York: Holt, Rinehart, and Winston.

Beittel, K.R. (1973). *Alternatives for art education research*. Dubuque, IA: W.C. Brown.

Betts, G.H. (1909). *The distribution and functions of mental imagery*. Unpublished doctoral dissertation, Columbia University.

Binet, A. (1908-1909). La Psychologie artistique de Tade Styka [The artistic psychology of Tade Styka]. *L'Annee psychologique*, *15*, 315-356.

Binet, A., & Simon, T. (1905). Methodes nouvelles pour le diagnostic du niveau intellectuel des anormaux [New methods for diagnosis of the intellectual level of abnormals]. *L'Annee psychologique*, *11*, 101-244.

Bonser, F.G. (1910). *The reasoning ability of children of the fourth, fifth, and sixth grades*. New York: Teachers College Press.

Broerman, E. (1909, December). L'ecole dans la nature [School in nature]. *Revue de l'Institute International d'Art Public, 8.*

Brown, D.D. (1897). *Notes on children's drawings, 2*(1). Berkeley, CA: University of California Press.

Buhler, K. (1919). *Die geistige Entwicklung des Kindes* [The mental development of the child]. (O.A. Oeser, Trans.) London: Routledge and Kegan Paul.

Burk, F. (1902, September). The genetic versus the logical order in drawing. *Pedagogical Seminary, 9*(3), 296-323.

Burkhart, R.C. (1962). *Spontaneous and deliberate ways of learning.* Scranton, PA: International Textbook Company.

Burkhart, R.C. (1968). *Identity and teacher learning.* Scranton, PA: International Textbook.

Buros, O.K. (Ed.). (1938). *The 1938 mental measurements yearbook.* New Brunswick, NJ: Rutgers University Press.

Buros, O.K. (Ed.). (1941). *The 1940 mental measurements yearbook.* Highland Park, NJ: The Mental Measurements Yearbook.

Buros, O.K. (Ed.). (1949). *The third mental measurements yearbook.* Highland Park, NJ: Rutgers University Press.

Buros, O.K. (Ed.). (1953). *The fourth mental measurements yearbook.* Highland Park, NJ: The Gryphon Press.

Buros, O.K. (Ed.). (1959). *The fifth mental measurements yearbook.* Highland Park, NJ: The Gryphon Press.

Buros, O.K. (Ed.). (1965). *The sixth mental measurements yearbook.* Highland Park, NJ: The Gryphon Press.

Buros, O.K. (Ed.). (1973). *The seventh mental measurements yearbook.* Highland Park, NJ: The Gryphon Press.

Buros, O.K. (Ed.). (1974). *Tests in print II.* Highland Park, NJ: The Gryphon Press.

Buros, O.K. (Ed.). (1978). *The eighth mental measurements yearbook.* Highland Park, NJ: The Gryphon Press.

Burt, C. (1921). *Mental and scholastic tests.* London: P.S. King and Son.

Cane, F. (1939). Art in the life of the child. In G. Hartman & A. Schumaker (Eds.). *Creative expression: The development of children in art, music, literature, and dramatics* (pp. 42-49). New York: John Day.

Cane, F. (1951). *The artist in each of us.* New York: Pantheon Books.

Carothers, T., & Gardner, H. (1979). When children's drawings become art: The emergence of aesthetic production and perception. *Developmental Psychology, 15*(5), 570-580.

Chamberlain, A.F. (1900). *The child: A study in the evolution of man.* New York: Scribners.

Childs, H.G. (1915, September). Measurement of the drawing ability of two thousand one hundred and seventy-seven children in Indiana city school systems by a supplemented Thorndike scale. *The Journal of Educational Psychology, 6*(7), 391-408.

Christensen, E.O., & Karwoski, T. (1926). A test in art appreciation. *University of North Dakota Departmental Bulletin, 10*(7).

Clamparede, E., & Geux. (1907). Plan d'experiences collectives sur le dessin des enfants [Level of collective experience on children's drawings]. *Archives de Psychologie, 6,* 276-278.

Clark, A.B. (1897). The child's attitude toward perspective problems. In E. Barnes (Ed.). *Studies in education, 1*(8), 283-294.

Clark, G.A. (1972). *An investigation of children's abilities to form and generalize visual concepts from visually complex art reproductions.* Project #0-1-060. Washington, DC: U.S. Office of Education, Bureau of Research.

Clark, G.A. (1973). Analyzing inconic learning in the visual arts. *Studies in Art Education, 14*(3), 35-47.

Clark, G.A. (1982). Making art essential in education. In R. Smith (Ed.), *Art and basic education* (pp. 62-79). Champaign-Urbana, IL: Council for Policy Studies in Art Education.

Clark, G.A. (1984). Establishing reliability of a newly designed visual concept generalization test in the visual arts. *Visual Arts Research, 10*(2), 73-78.

Clark, G.A., & Zimmerman, E. (1984). *Educating artistically talented students.* Syracuse, NY: Syracuse University Press.

Clark, G.A., & Zimmerman, E. (in press). *Resources for educating artistically talented students.* Syracuse, NY: Syracuse University Press.

Clark, J.S. (1897). Some observations on children's drawings. *Educational Review, 13*, 76-82.

Clifford, G.J. (1983). The life story biographic study. In J.H. Best (Ed.), *Historical inquiry in education: A research agenda*. Washington, DC: The American Educational Research Association.

Cockrell, D.L. (1930). Design in the paintings of young children. *School Arts, 30*, 33-39, 112-119.

Cole, N. (1940). *The arts in the classroom*. New York: John Day.

Cole, N. (1966). *Children's art from deep down inside*. New York: John Day.

Coles, R. (1964). *Children of crisis*. Boston, MA: Atlantic-Little, Brown.

Cooke, E. (1885, 1886). On art teaching and child nature. *Journal of Education, 8*(198), 12-15.

Correthers, L.Y. (1939). The development of creative impulses in art class. In G. Hartman & A. Schumaker (Eds.), *Creative expression: The development of children in art, music, literature, and dramatics* (pp. 22-26). New York: John Day.

Cronbach, L.J. (1960). *Essentials of psychological testing* (2nd ed.). New York: Harper and Row.

Cummings, P. (1979). *Artists in their own words*. New York: St. Martin's Press.

D'Amico, V. (1942). *Creative teaching in art*. Scranton, PA: International Textbook.

Daniels, P.C. (1933-1934). Discrimination of compositional balance at the pre-school level. In H.S. Langfeld (Ed.), *Psychological Monographs, 45*(1) (pp. 1-11). Princeton, NJ: The Psychological Review Company.

Day, M.D. (1976). Effect of instruction on high school students' art preferences and art judgments. *Studies in Art Education, 18*(1), 25-39.

Deporter, D., & Kavanaugh, R. (1978). Parameters of children's sensitivity to painting styles. *Studies in Art Education, 20*(1), 43-48.

Dewey, J. (1919). The psychology of drawing. *Bulletin Series #10, 3-5*. New York: Teachers College Press.

Dewey, J. (1934). *Art as experience*. New York: G.P. Putnam.

Dillard, A. (1982). *Living by fiction*. New York: Harper & Row.

Dow, A.W. (1908). *The theory and practice of teaching art*. New York: Teachers College, Columbia University.

Dow, M.L. (1933-1934). Playground behavior differentiating artistic from non-artistic children. In H.S. Langfeld (Ed.), *Psychological monographs, 45*(1) (pp. 82-94). Princeton, NJ: The Psychological Review Company.

Downey, J.E. (1929). *Creative imagination: Studies in the psychology of literature*. New York: Harcourt Brace.

Duck, J. (1913). Uber das zeichnerische und kunstlerische Interesse der Schuler [On students' interest in drawing and art]. *Zeitschrift fur experimentelle Psychologie, 12, 13*.

Duncum, P. (1986). Breaking down the alleged "U" curve of artistic development. *Visual Arts Research, 12*(1), 43-54.

Eisner, E.W. (n.d.). *Manual for the Eisner art information inventory and the Eisner art attitude inventory*. Published by the author.

Eisner, E.W. (1966). The development of information and attitudes towards art at the secondary and college levels. *Studies in Art Education, 8*(1), 43-58.

Eisner, E.W. (1967). The *development of drawing characteristics of culturally advantaged and culturally disadvantaged children*. Project #3086. Washington, DC: Office of Education, Bureau of Research.

Eisner, E.W. (1972). *Educating artistic vision*. New York: Macmillan.

Elderton, E. (1909). On the association of drawing with other aptitudes in school children. *Biometrika, 7*, 222-226.

Ellsworth, F.F. (1939). Elements of form in the free painting of twenty nursery school children. *Journal of Genetic Psychology, 20*, 487-501.

Eng, H. (1931). *The psychology of children's drawings: From the first stroke to the coloured drawing*. New York: Harcourt Brace.

Erickson, E.H. (1963). *Childhood and society*. New York: Norton.

Erickson, M. (1985). Styles of historical investigation. *Studies in Art Education, 26*(2), 121-124.

Fallows, J. (1985, December). The case against credentialism. *The Atlantic Monthly*, 49-67.

Feldman, D.H. (1980). *Beyond universals in cognitive development*. Norwood, NJ: Ablex.

Feldman, D.H. (1985). The concept of non-universal developmental domains: Implications for artistic development. *Visual Arts Research, 11*(1), 82-89.

Findley, M.E. (1906-1907). Design in the art training of young children. *Child Life*, London.

Fishkowitz, A. (1983). An inductive study of the abilities involved in drawing. Unpublished doctoral dissertation, Columbia University.

Freeman, N. (1980). *Strategies of representation in young children*. London: Academic Press.

Fritz, H.E. (1930). A search for conservation of the gifted. *Bulletin of High Points, 12*(8), 19-25.

Foucault, M. (1983). *This is not a pipe* (J. Harkness, Trans.). Berkeley: University of California Press. (Original work published 1973).

Galton, F. (1869). *Hereditary genius: An inquiry into its consequences*. London: Macmillan. (Published 1892, 1914, 1925.)

Gaitskell, C.D., Hurwitz, A., & Day, M.D. (1982). *Children and their art: Methods for the elementary school*. San Diego, CA: Harcourt, Brace, Jovanovich.

Gardner, H. (1973). *The arts and human development*. New York: John Wiley and Sons.

Gardner, H. (1980). *Artful scribbles: The significance of children's drawings*. New York: Basic Books.

Gardner, H. (1982). *Art, mind, and brain: A cognitive approach to creativity*. New York: Basic Books.

Gardner, H. (1983). *Frames of mind: The theory of multiple intelligences*. New York: Basic Books.

Gardner, H. (1986). *The mind's new science: A history of the cognitive revolution*. New York: Basic Books.

Gardner, H., Winner, E., & Kircher, M. (1975). Children's conceptions of the arts. *Journal of Aesthetic Education, 9*(3), 60-77.

Golomb, C. (1973). Children's representation of the human figure: The effects of models, media and instruction. *Genetic Psychology Monographs, 87*, 197-251.

Golomb, C. (1974). *Young children's sculpture and drawing: A study in representational development*. Cambridge, MA: Harvard University Press.

Golomb, C. (1981). Representation and reality: The origin and determinants of young children's drawings. *Review of Research in Visual Arts Education, 14*, 36-48.

Golomb, C. (1983). On imaginary or real decalages in children's representations: Compositional trends in drawing, completion, and selection tasks. *Visual Arts Research, 9*(2), 71-81.

Goodenough, F. (1924). *The intellectual factor in children's drawings*. Unpublished doctoral dissertation, Stanford University.

Goodenough, F. (1926). *Draw-a-man test*. New York: World Book.

Goodenough, F. (1926). *Measurement of intelligence by drawings*. New York: Harcourt, Brace and World.

Goodenough, F. (1931). Children's drawings. In Murchison, C. (Ed.), *A handbook of child psychology* (1st ed.) (pp. 480-544). Worcester, MA: Clark University Press.

Goodman, N. (1968). *Languages of art: An approach to a theory of symbols*. Indianapolis, IN: Bobbs-Merrill.

Goodnow, J. (1977). *Children drawing*. Cambridge, MA: Harvard University Press.

Gotze, K. (1898). *Das Kind als Kunstler* [The child as artist]. Hamburg.

Gowan, J.C. (1977). Background and history of the gifted-child movement. In J.C. Stanley, W.C. George, & C.H. Solano (Eds.), *The gifted and the creative: A fifty-year perspective* (pp. 5-27). Baltimore, MD: Johns Hopkins University Press.

Graewe, H. (1898). *Untersuchung der Entwickelung des Zeichnens* [A study of the development of drawing]. Halle: Schroedel.

Graves, M. (1946). *Graves design judgment test*. New York: The Psychological Corporation. (Reprinted 1974, 1978).

Griffiths, R. (1935). *A study of imagination in early childhood*. London: Routledge and Kegan Paul.

Grippen, V.J. (1933-1934). A study of creative artistic imagination in children by the constant contact procedure. In H.S. Langfeld (Ed.), *Psychological Monographs, 45*(1) (pp. 63-81). Princeton, NJ: The Psychological Review Company.

Grosser, H., & Stern, W (1913). *Das freie Zeichnen und Formen des Kindes* [The free drawings and forms of children]. Leipsig: Barth.

Hacker, A. (1986, February 13). The decline of higher learning. *The New York Review of Books*, 35-42.

Harris, D.B. (1963). *Children's drawings as measures of intellectual maturity: A revision and extension of Goodenough draw-a-man test*. New York: Harcourt, Brace & World.

Hartlaub, F. (1930). *Der Genius in Kinde* [The genius in the child]. Breslau: Ferdinand Hirt.

Hartman, G., & Schumaker, A. (Eds.). (1926). *Creative expression: The development of children in art, music, literature and dramatics*. New York: John Day. (Published in 1926, 1927, 1928, 1931, 1932, 1939).

Herrick, M.A. (1893). Children's drawings. *Pedagogical Seminary, 3*, 338-339.

Hirsch, N.D.M. (1931). *Genius and creative intelligence*. Cambridge, MA: Science-Art.

Hoffmann, B. (196). *The tyranny of testing*. New York: Crowell-Collier Press.

Hoffman, H. (n.d.). *Slovenly Peter; Or cheerful stories and funny pictures for good little folks*. Philadelphia, PA: Henry T. Coates.

Hollingworth, H.L. (1943). *Leta Stetter Hollingworth: A biography*. Lincoln, NE: University of Nebraska Press.

Hollingworth, L.S. (1923). *Special talents and defects: Their significance for education*. New York: Macmillan.

Hollingworth, L.S. (1926). *Gifted children: Their nature and nurture*. New York: Macmillan.

Hollingworth, L.S. (1933). The child of special gifts and special deficiencies. In G.A. Murchison (Ed.), *A handbook of child psychology* (2nd ed.) (pp. 842-857). Worcester, MA: Clark University Press.

Hollingworth, L.S. (1943). *Leta Stetter Hollingworth: A biography*. Lincoln, NE: University of Nebraska Press.

Horn, C.C. (1935). *The Horn art aptitude inventory*. Chicago: C.H. Stoelting. (Reprinted 1953).

Hoyle, E., & Wilks, J. (1975). *Gifted children and their education*. London: Department of Education and Science.

Inglehart, R. (1960). Identifying art talent. In B. Shertzer (Ed.), *Working with superior students*. Chicago: Science Research Associates.

Ivanoff, E. (1908). Le dessin des ecoliers de la suisse romande [The drawings of French speaking Swiss schoolchildren]. *Archives de Psychologie, 8*, 97ff.

Ivanoff, E. (1909). Researches experimentales sur le dessin des ecoliers de la Suisse romande: Correlation entre l'aptitude au dessin et les autres aptitudes [Experimental research on the drawing of French speaking Swiss students: Correlation between drawing aptitude and other aptitudes]. *Archives de Psychologie, 8*, 97-156.

Jasper, C.C. (1931). A study of the responsiveness of pre-school children to rhythm by regular repetition in two-dimensional design forms. Unpublished masters thesis, University of Iowa.

Jasper, C.C. (1933-1934). The sensitivity of children of pre-school age to rhythm in graphic form. In H.S. Langfeld (Ed.), *Psychological monographs, 45*(1) (pp. 12-25). Princeton, NJ: The Psychological Review Company.

Judd, C.H., & Cowling, D.J. (1907). Studies in perceptual development. *Psychological Review Monographs, 8*, 349-369.

Katzaroff, M.D. (1910). Qu'est-ce que les enfants dessinent? [What do children draw?]. *Archives de Psychologie, 9*, 125-133.

Kellogg, R. (1959). *What children scribble and why*. Palo Alto, CA: National Press.

Kellogg, R. (1969). *Analyzing children's art*. Palo Alto, CA: National Press.

Kerchensteiner, I.G. (1905). *Die entwickelung der zeichnerischen begabung* [The development of drawing ability]. Munich: Gerber.

Kerr, M. (1937). Children's drawings of houses. *British Journal of Medical Psychology, 16*, 206-218.

Khatena, J. (1982). *Educational psychology of the gifted*. New York: John Wiley and Sons.

Kik, C. (1908). Die ubernormale zeichnenbegabung bei kindern [The above average drawing talent in children]. *Zeitschriff fur Angewandte Psychologie, 2*, 92-149.

Klar, W.H., & Winslow, L.L. (1933). *Art education in principle and practice*. Springfield, MA: C. Valentine Kirby.

Kline, L.W. & Carey, G.L. (1922). *A measuring scale for freehand drawing*. Johns Hopkins University Studies in Education, No. 5a. Baltimore, MD: Johns Hopkins University Press.

Knauber, A. (1932, 1935). *Knauber art ability test and Knauber art vocabulary test*. Published by the author.

Kohler, F. (1908). Sammlungen freier Kinderzeichnungen [Collections of children's free drawings]. In W. Stern, F. Kohler, & M. Verworn (Eds.), *Zeitschrift fur angewannte Psychologie, 1*, 179-187, 472-476.

Kretzschmar, J. (1910). Sammlungen freier Kinderzeichnungen [Collections of children's free drawings]. *Zeitschrift fur angewannte Psychologie, 3*, 459-463.

Lamprecht, K. (1906). Les dessins d'enfants comme source historique [Children's drawings as an historical source]. *Bulletin de l'Academic Royale de Belgique, 9-10*, 457-469.

Lanier, V. (1983). *The visual arts and the elementary child*. New York: Teachers College Press.

Lark-Horovitz, B. (1937). On art appreciation of children: I. Preference of picture subjects in general. *Journal of Education Research, 31*(8), 572-598.

Lark-Horovitz, B. (1942). Children's art abilities: Studies at the Cleveland museum of art. In T. Munro, B. Lark-Horovitz, & E.N. Barnhart, *The Journal of Experimental Education, 11*(2), 97-155.

Lark-Horovitz, B., Lewis, H., & Luca, M. (1967). *Understanding children's art for better teaching*. Columbus, OH: Charles E. Merrill.

Levinstein, S. (1905). *Kinderzeichnungen bis zum 14 Lebensjahre. Mit Parallelen aus der Urgeschichte, Kulturgeschichte, und Volkerkunde* [Children's drawings up to age 14. With parallels to the earliest history, the history of civilization and folklore]. Leipsig: Voigtlander.

Lewis, H.P. (1973). Spatial relations in children's drawings: A cross-generational comparison. *Studies in Art Education, 15*(3), 49-56.

Lewerenz, A.S. (1927). *Test in fundamental abilities in the visual arts*. Los Angeles, CA: California Test Bureau.

Lichtwark, A. (1887). *Die kunst in der schule* [Art in the school]. (Cited in Michael & Morris, 1986).

Lincoln, Y.S., & Guba, E.G. (1985). *Naturalistic inquiry*. Beverly Hills, CA: Sage Publications.

Lobsein, M. (1905, 1907). Kinderzeichnung und Kunstkanon [Children's drawings and the standards of art]. *Zeitschrift fur padagogik Psychologie*, 393-404.

Lovano-Kerr, J., & Rush, J. (1982). Project Zero: The evolution of visual arts research during the seventies. *Review of Research in Visual Arts Education, 15*, 61-81.

Lowenfeld, V. (1939). *The nature of creative activity*. London: Kegan Paul, Trench, and Trubner.

Lowenfeld, V. (1952). *The nature of creative activity* (rev. ed.). New York: Harcourt Brace Jovanovich.

Lowenfeld, V. (1954). *Your child and his art: A guide for parents*. New York: Macmillan.

Lowenfeld, V. (1947, 1952, 1957). *Creative and mental growth*. New York: Macmillan.

Lowenfeld, V., & Brittain, W.L. (1964, 1970, 1975). *Creative and mental growth*. New York: Macmillan.

Lukens, H.T. (1896, October). A study of children's drawings in the early years. *Pedagogical Seminary, 4*(1), 79-110.

Luquet, M.G. (1913). *Les dessins d'un enfant* [The drawings of a child]. Paris: Alcan.

MacGregor, R.N. (1972). The development and validation of a perceptual index for utilization in the teaching of art. *Studies in Art Education, 13*(2), 11-18.

MacGregor, R.N. (1975). Response strategies adopted by elementary school children to items in a perceptual index: An exploratory study. *Studies in Art Education, 16*(3), 54-61.

MacGregor, R.N. (1982). The empty center: Anthropological methods for art educators. *Studies in Art Education, 24*(1), 3-4.

Maitland, L. (1895, September). What children draw to please themselves. *Inland Educator, 1*, 77-81.

Maitland, L. (1895). The art of little children. *Pedagogical Seminary, 3*(2), 302-307.

Manuel, H.T. (1919). Talent in drawing: An experimental study of the use of tests to discover special ability. *School and Home Education Monograph No. 3*. Bloomington, IL: Public School Publishing.

Marland, S.P. (1972). *Education of the gifted and talented. Vol. 1*. Report to the Congress of the United States by U.S. Commissioner of Education. Washington, DC: U.S. Government Printing Office.

McAdory, M. (1929). *McAdory art test*. New York: Bureau of Publications, Teachers College Press.

McCall, W.A. (1922). *How to measure education*. New York: Macmillan.

McCarty, S.A. (1924). *Children's drawings: A study of interests and abilities*. Baltimore, MD: Williams & Wilkins.

Mearns, H. (1939). The creative spirit and its significance for education. In G. Hartman & A. Schumaker (Eds.), *Creative expression: The development of children in art, music, literature, and dramatics* (pp. 13-21). New York: John Day.

Meier, N.C. (1926). Aesthetic judgment as a measure of art talent. In N.C. Meier (Ed.), *The University of Iowa studies: Series of aims and progress of research, I*(9) (pp. 7-30). Iowa City, IA: The University of Iowa Press.

Meier, N.C. (1927). Can art talent be discovered by test devices? *Annual Report of the Western Arts Association*, 74-79.

Meier, N.C. (1928-1929). A measure of art talent. In W.R. Miles & D. Starch (Eds.), *Psychological monographs, 39* (Seashore Commemorative Number) (pp. 184-199). Princeton, NJ: The Psychological Review Company.

Meier, N.C. (Ed.). (1933). Studies in the psychology of art: Vol. 1. *Psychological monographs, 45*. Princeton, NJ: The Psychological Review Company.

Meier, N.C. (1934, September 1). What we now know about talent in children. *Western Arts Association Annual Report*, 143-163.

Meier, N.C. (Ed.). (1936). Studies in the psychology of art: Vol. 2. *Psychological monographs, 48*. Princeton, NJ: The Psychological Review Company.

Meier, N.C. (1939). Factors in artistic aptitude: Final summary of a ten-year study of special ability. *Psychological monographs, 51*, 140-158. Princeton, NJ: The Psychological Review Company.

Meier, N.C. (Ed.). (1939). Studies in the psychology of art: Vol. 3. *Psychological monographs, 51*. Princeton, NJ: The Psychological Review Company.

Meier, N.C. (1940). *Meier art tests: I. Art judgment*. Iowa City, IA: State University of Iowa, Bureau of Educational Research and Service. (Reprinted 1942).

Meier, N.C. (1941). Knauber art ability test. In O.K. Buros (Ed.), *The 1940 mental measurements yearbook* (pp. 143-144). Highland Park, NJ: The Mental Measurements Yearbook.

Meier, N.C. (1942). *Art in human affairs: An introduction to the psychology of art*. New York: McGraw-Hill.

Meier, N.C. (1943). *Military psychology*. New York: Harper and Brothers.

Meier, N.C. (1949). The role of public opinion. In N.C. Meier & A. Saunders (Eds.), *Polls and public opinion*. New York: Holt.

Meier, N.C. (1958). Creative processes of artists (summary). Grant No. 43, Johnson Fund (1955). *Yearbook of the American Philosophical Society*, 279-282.

Meier, N.C. (1963). *Meier art tests: II. Aesthetic perception*. Iowa City, IA: Bureau of Educational Research and Service.

Meier, N.C. (1965). *Special ability: Creative processes of artists*. Terminal Report Research Project, NIH M-6192, 1962-1965. Iowa City, IA: The University of Iowa.

Meier, N.C., & Seashore, C.E. (1929). *Meier-Seashore art judgment tests*. Iowa City, IA: University of Iowa.

Meumann, E. (1912). Ein program zur psychologischen untersuchung des zeichnens [A program for the psychological investigation of drawing]. *Zeitschrift fur Padagogische Psychologie*.

Meumann, E. (1914). Die Analyse des Zeichnens und Modellierens [The analysis of drawing and modelling]. *Vorlesungen zur Einfuhrung in die Experimentelle Podagogik* [Lectures for an introduction to experimental pedagogy] (pp. 693-775). Leipsig: Englemann.

Michael, J.A., & Morris, J.M. (1986). A sequel: Selected European influences on the theory and philosophy of Viktor Lowenfeld. *Studies in Art Education, 27*(3), 131-139.

Miles, W., & Starch, D. (Eds.). (1928-1929). *Psychological monographs*, 39 (Seashore commemorative number). Princeton, NJ: The Psychological Review Company.

Mullins, N. (1971). *The art of theory: Construction and use*. New York: Harper and Row.

Mullins, N. (1974). Theory construction from available materials: A system for organizing and presenting propositions. *American Journal of Sociology, 80*(1), 1-15.

Munro, T., Lark-Horowitz, B., & Barnhardt, E.N. (1942). Children's abilities: Studies at the Cleveland Museum of Art. *Journal of Experimental Education, 11*(2), 97-184.

Murphy, G. (1933). General *psychology*. New York: Harper and Brothers.

NAEP. (1977). *Design and drawing skills: Selected results from the first National Assessment of Art*. Report #06-A-01. Denver, CO: Author.

NAEP. (1977). Art zeal high, knowledge lacking. *NAEP Newsletter, 10*(6), 1-4.

NAEP. (1978). Bright, dark sides seen in art attitudes of U.S. youth. *NAEP Newsletter, 11*(3), 1-2.

NAEP. (1981). *Art and young Americans, 1974-79: Results from the second art assessment*. Report #10-A-01. National Assessment of Educational Progress. Denver, CO: Education Commission of the State.

NAEP. (1981-1982). Tastes in art turn toward the traditional. NAEP *Newsletter, 14*(4), 1-2, 4.

NAEP. (1981-1982). '81 education story good news, bad news. NAEP *Spotlight, 14*(4), 2.

Nicholas, F.W., Mawhood, N.C., & Trilling, M.B. (1937). *Art activities in the modern school*. New York: Macmillan.

O'Hare, D. *Psychology and the arts*. Brighton, Sussex: Harvester.

Oliver, F. (1974). Le dessin enfantin est-il une ecriture? [Is childish drawing handwriting?] *Enfance*, 3-5, 183-216.

O'Shea, M.V. (1894). Children's expression through drawing. *Proceedings of the National Education Association*, 1015-1023.

Partridge, L. (1902). Children's drawings of men and women. In E. Barnes (Ed.), *Studies in Education, 2*(5), 163-179.

Partridge, S. (1904). Children's drawings. *The Paidologist, 6*(3), 130-168.

Passy, J. (1891, December). Notes sur des dessins des enfants [Notes on the drawings of children]. *Revue Philosophique*, 614-621.

Percy, W. (1971). *Love in the ruins*. New York: Avon.

Perez, B. (1888). *L'Art et la poesee chez l'enfant* [Art and poetry of the child]. Paris: F. Alcan.

Piaget, J., & Inhelder, B. (1956). *The child's conception of space* (Langdon & Langer, Trans.). London: Routledge and Kegan Paul.

Read, H. (1943). *Education through art*. New York: Pantheon.

Ricci, C. (1887). *L'Arte dei bambini* [The art of the child]. Bologna: N. Zanchelli.

Rodgers, F. (1933-1934). Variations in the aesthetic environment of artistic and non-artistic children. In H.S. Langfeld (Ed.), Psychological *monographs, 45*(1) (pp. 95-107). Princeton, NJ: The Psychological Review.

Rosario, J. (1977). Children's conceptions of the arts: A critical response to Howard Gardner. *Journal of Aesthetic Education, 11*(1), 91-100.

Rouma, G. (1913). *Le langage graphique de l'enfant* [The child's graphic language]. Paris: Alcan.

Rugg, H.O. (1916). The experimental determination of mental discipline in school subjects. Unpublished master's thesis, University of Illinois.

Salkind, L., & Salkind, N. (1973). A measure of aesthetic preference. *Studies in Art Education, 15*(1), 21-27.

Sargent, W., & Miller, E. (1916). *How children learn to draw*. Boston: Ginn.

Saunders, A.W. (1930). An objective psychology of analysis of fundamental art ability. Unpublished master's thesis, Washington University, St. Louis.

Saunders, A.W. (1936). The stability of artistic aptitude at the child level. *Psychological monographs, 48*, 126-154.

Saunders, A.W. (1941). Meier-Seashore art judgment test. In O.K. Buros (Ed.), *The 1940 mental measurements yearbook* (p. 148). Highland Park, NJ: The Mental Measurements Yearbook.

Savarese, J., & Miller, R. (1979). Aesthetic preferences and cognitive-perceptual style. *Studies in Art Education, 20*(2), 45-51.

Schaefer-Simmern, H. (1948). *The unfolding of artistic activity*. Berkeley, CA: University of California Press.

Schubert, D.S.P. (1973). Intelligence as necessary but not sufficient for creativity. *Journal of Genetic Psychology, 122*, 45-47.

Schultz, H.A. (1953). Meier art tests: I. Art judgment. In O.K. Buros, (Ed.), *The fourth mental measurements yearbook* (pp. 339-340). Highland Park, NJ: The Gryphon Press.

Schuyten, M.C. (1901). Het oorspronkelijk teekenen als bijdrage tot kinkeranalyse [Early drawing as a contribution to child analysis]. *Paedologisch Yaarboek, 2*, 112-126.

Schuyten, M.C. (1904). De oorspronkelijke 'ventjes' der Antwerpsche schoolkindern [The early "little men" of Antwerp school children]. *Paedologisch Yaarboek, 5*, 1-87.

Schuyten, M.C. (1907). Note pedagogique sur le dessins des enfants [An educational note on children's drawings]. *Archives de Psychologie, 6*, 389-391.

Seashore, C.E. (1942). *Pioneering in psychology*. University of Iowa Studies No. 398. Iowa City, IA: The University of Iowa Press.

Sevigny, M.J. (1981). Triangulated inquiry—a methodology for analysis of classroom interaction. In J. Green & C. Wallat (Eds.), *Ethnography and language in educational settings* (pp. 65-81). Norwood, NJ: Ablex.

Shinn, M.W. (1893). Notes on the development of a child. *University of California Studies: Vol. 1*. Berkeley, CA: University of California Press.

Siegel, L. (1972). The Meier art tests: II. Aesthetic perception. In O.K. Buros (Ed.), *The seventh mental measurements yearbook*. Highland Park, NJ: The Gryphon Press.

Silver, R. (1983). *Silver drawing test of cognitive and creative skills*. Seattle, WA: Special Child Publications.

Silverman, R., Hoepfner, R., & Hendricks. (1969). *Art vocabulary test*. Hollywood, CA: Monitor.

Sloan, H.J., & Sullivan, E. (1982, April). An art test? . . . Are you kidding? *Arts and Activities, 91*, 40-41.

Spearman, C. (1904). "General intelligence" objectively determined and measured. *American Journal of Psychology, 15*(1), 201-293.

Stake, R.E. (1980, April). Generalizations. Paper presented at the annual meeting of the American Educational Research Association, Boston.

Stern, C., & Stern, W. (1909-1910). Die zeichnerische Entwickelung eines Knaben vom 4 bis zum 7 Jahr [The drawing development of a boy from 4 to 7 years]. *Zeitschrift fur angewandte Psychologie, 3*, 1-31.

Stern, W. (1906, October). Spezielle Beschreibung der Ausstellung freier Kinderzeichnungen aus Breslau [Special descriptions of the exhibition of children's free drawings from Breslaw]. *Bericht uber den Kongress fur Kinderforschung und Jugendfursorge in Berlin*, 411-417.

Stern, W. (1911). The supernormal child. *Journal of Educational Psychology, 2*, 143-148, 181-190.

Sullivan, G.L. (1986). A covariance structure model of symbolic functioning: A study of children's cognitive style, drawing, clay modeling, and storytelling. *Visual Arts Research, 12*(1), 11-32.

Sully, J. (1895). *Studies of childhood*. New York: Longmans.

Sully, J. (1907). *Children's ways*. New York: D. Appleton.

Terman, L.M. (1916). *The measurement of intelligence*. Boston: Houghton Mifflin.

Terman, L.M. (1925). *Genetic studies of genius, Vol. 1: Mental and physical traits of a thousand gifted children*. Stanford, CA: Stanford University Press.

Terman, L.M. (1932). Autobiography. In C.A. Murchison (Ed.), *A history of psychology in autobiography, 2*, 297-332. Worcester, MA: Clark University Press.

Terman, L.M., & Burks, B.S. (1933). The gifted child. In C. Murchison (Ed.), *A Handbook of Child Psychology* (2nd ed.) (pp. 773-801). Worcester, MA: Clark University Press.

Terman, L.M., & Oden, M.H. (1959). *Genetic studies of genius, Vol. V: The gifted group at mid-life: Thirty-five years' follow-up of the superior child*. Stanford, CA: Stanford University Press.

Thompson, W. (1971). *At the edge of history*. New York: Harper.

Thorndike, E.L. (1913). The measurement of achievement in drawing. *Teachers College Record, 14*(5), 345-383.

Thorndike, E.L. (1916). Tests of esthetic appreciation. *The Journal of Educational Psychology, 7*(10), 509-517.

Thorndike, E.L. (1921). On the organization of intellect. *Psychological Review, 28*, 141-151.

Thurstone, L.L. (1938). Primary mental abilities. *Psychometric Monograph No. 1*. Chicago: University of Chicago Press.

Wilson, B., & Wilson, M. (1982c, Winter). The case of the disappearing two-eyed profile:

Or how little children influence the drawings of little children. *Review of Research in Visual Arts Education, 15*, 18-31.

Wilson, B., & Wilson, M. (1984). Children's drawings in Egypt: Cultural style acquisition as graphic development. *Visual Arts Research, 10*(1), 13-26.

Wilson, M., & Wilson, B. (1982). *Teaching children to draw: A guide for teachers and parents*. Englewood Cliffs, NJ: Prentice Hall.

Winner, E. (1982). *Invented worlds*. Cambridge, MA: Harvard University Press.

Winner, E., & Gardner, H. (1981, Fall). The art in children's drawings. *Visual Arts Research, 14*, 18-31.

Wulff, O. (1927). Die kunst des kindes [The art of the child]. Stuttgart: Ferdinand Enke.

Youngblood, M. (1979). A non-verbal ability test. *Studies in Art Education, 20*(3), 52-63.

Ziegfeld, E. (1949). Meier art Tests: I. Art judgment. In O.K. Buros (Ed.), *The third mental measurements yearbook* (p. 258). New Brunswick, NJ: Rutgers University Press.

Ziegfeld, E. (1953). The Horn art aptitude inventory. In O.K. Buros (Ed.), *The fourth mental measurements yearbook*. Highland Park, NJ: The Gryphon Press.

Zimmerman, E. (1982). Digraph analysis and reconstruction of Broudy's aesthetic education theory: An exemplar for aesthetic education theory analysis and construction. *Studies in Art Education, 23*(3), 39-47.

Zimmerman, E. (1983). Cognitive style and related issues: New directions for research in art education. *Journal of Art and Design Education, 2*(1), 15-30.

Tiebout, C. (1933-1934). The psychophysical functions differentiating artistically superior from artistically inferior children. In H.S. Langfeld (Ed.), *Psychological monograph, 45*(1), 108-133. Princeton, NJ: The Psychological Review Company.

Tiebout, C., & Meier, N.C. (1936). Artistic ability and general intelligence. In N.C. Meier (Ed.), Studies in the psychology of art: Vol. 2. *Psychological Monographs, 48*(1), 95-125. Princeton, NJ: The Psychological Review Company.

Todd, J.L. (1931). *Drawing in the elementary school*. Chicago: Laboratory Schools of the University of Chicago No. 2.

Varnum, W.H. (1939, 1946). *Selective art aptitude test*. Scranton, PA: International Textbook.

Vernon, P.E., Adamson, G., & Vernon, D. (1977). *The psychology and education of gifted children*. Boulder, CO: Viewpoint Press.

Viola, W. (1942). *Child art* (2nd ed.). London: University of London Press.

Walton, W. (1933-1934). The sensitivity of children and adults to color harmony. In H.S. Langfeld (Ed.), *Psychological monographs, 45*(1), 51-62. Princeton, NJ: The Psychological Review Company.

Ward, B.J. (1982, Fall). A look at students' art achievements: Results from the National Assessment of Educational Progress. *Visual Arts Research, 16*, 12-18.

Whipple, G.M. (1914-1915). *Manual of mental and physical tests: Vols. 1 and 2*. Baltimore, MD: Warwick and York.

Whipple, G.M. (1919). *Classes for gifted children*. Bloomington, IL: Public School Publishing Company.

Whitford, W.G. (1919). Empirical study of pupil-ability in public-school art courses. *Elementary School Journal, 10*(1), 33-46; *10*(2), 95-105.

Whorley, K.S. (1933-1934). An experimental investigation of the sensitivity of children to compositional unity. In H.S. Langfeld (Ed.), *Psychological monographs, 45*(1), 26-45. Princeton, NJ: The Psychological Review Company.

Willats, J. (1977). How children learn to represent three-dimensional space in drawings. In G. Butterworth (Ed.), *The child's representation of the world*. New York: Plenum Press.

Williams, E.J. (1933-1934). A technique for testing color harmony sensitivity in young children. In H.S. Langfeld (Ed.), *Psychological monographs, 45*(1), 46-50. Princeton, NJ: The Psychological Review Company.

Wilson, B. (1966). An experimental study designed to alter fifth and sixth grade students' perceptions of paintings. *Studies in Art Education, 8*(1), 33-42.

Wilson, B. (1981, Fall). Response to Winner and Gardner. *Visual Arts Research, 14*, 32-33.

Wilson, B. (1985). The artistic tower of Babel: Inextricable links between culture and graphic development. *Visual Arts Research, 11*(1), 90-104.

Wilson, B., & Wilson, M. (1977). An iconoclastic view of the imagery sources in the drawings of young people. *Art Education, 30*(1), 5-12.

Wilson, B., & Wilson, M. (1979). Figure structure, figure action, and framing in drawings by American and Egyptian children. *Studies in Art Education, 21*(1), 36-43.

Wilson, B., & Wilson, M. (1982, Winter). The persistence of the perpendicular principle: Why, when, and where innate factors determine the nature of drawings. *Review of Research in Visual Arts Education, 15*, 1-18.